

# ARIZONA MEDICINE

Journal of ARIZONA MEDICAL ASSOCIATION

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DECEMBER, 1956



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"Fishberg, A. M.: Hypertension and Nephritis, ed. 5, Philadelphia, Lea & Febiger, 1954, pp. 177-178.



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# ARIZONA MEDICINE

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## Original ARTICLES

### CHRONIC COR PULMONALE — DIAGNOSIS & TREATMENT

Morris Deitchman, M.D., F.A.C.P. and E. H. Bregman, M.D., D.A.B.R.  
Phoenix, Arizona

**T**HE COMMON pulmonary diseases which cause cor pulmonale are pulmonary tuberculosis and bronchiectasis. The less common causes may result from (1) tracheal or bronchial stenosis, (2) pulmonary collapse in infancy, (which is being recognized more frequently), (3) failure of the alveoli to develop, (4) mechanical factors resulting from chest deformities, (5) pulmonary arteriovenous communications either congenital or acquired, (6) intrathoracic conditions producing pressure on the main pulmonary arteries such as obstructions by syphilitic aortic aneurysm, mediastinal tumors, etc.

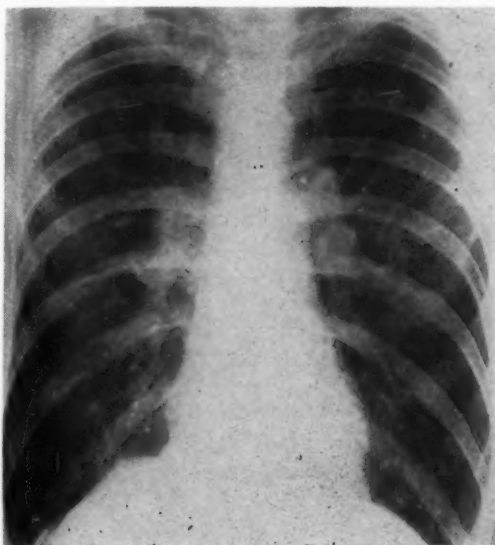
Historically primary endarteritis obliterans of the pulmonary arteries was described by Ayerza (2) in 1901 and Arrilage (3) in 1911 and called either cor pulmonale or "black cardiacs" because of the marked cyanosis attending this condition. At that time cor pulmonale or Ayerza's disease was considered unusual.

Earlier recognition of enlargement of the right heart in association with chronic pulmonary disease dates back about 150 years. Senac (4) described changes at autopsy in 1783, Louis (4) described similar changes in 1830, Budd (4) recognized enlargement of the right ventricle secondary to chronic pulmonary disease at autopsy in 1840, and Sibson (4) went into the details of these findings in 1848.

The authors became interested in cor pulmonale, in this area, because of the local concentration of chronic pulmonary disease. We had the opportunity to view about 3600 chest X-rays while employed respectively as chief

of cardiology and consultant in X-ray at the local Veterans Administration regional office. A large number of these patients were studied for the presence of chronic cor pulmonale. Oblique as well as P-A views of the chest were made, if enlargement of the pulmonary conus and pulmonary segment of the right ventricle were suspected.

Roessler (5), Dressler (6), Storch (7), Zadansky (8), and "The Criteria of the American Heart Association" (9) suggest that the early recogni-



4870—H. P., Age 34—(PA view). Severe asthma, emphysema, bronchiectasis. Allergies since childhood. The prominent pulmonary vessels are seen in the PA view. There are plain film changes suggesting bronchiectasis and emphysema. Note: The elongation and flattening of the upper segment of the left cardiac border in the vicinity of the main pulmonary artery.

tion of enlargement of the pulmonary segment is possible only in the right anterior oblique views. This silhouette is well illustrated with the heart models of the American Heart Association. The right heart enlargement of cor pulmonale can be shown even in early cor pulmonale only in the R.A.O. position.

Reviews of pathological material, two of which were made in Arizona, point out the failure to make early clinical diagnosis of cor pulmonale. Doctors Walzer and Frost (4) at VA Center, Whipple, Arizona, showed an 80% discrepancy between clinical and autopsy diagnosis. From November 1, 1953 to November 1, 1954, there was enlargement of the right ventricle in 36 of 103 autopsies at another VA hospital. These 36 patients with right ventricular enlargement did not die as the result of right heart enlargement, but at least five of these deaths were due to right heart failure. The 31 others with right heart enlargement had manifest right heart enlargement at autopsy, which was not recognized. "This condition — cor pulmonale or pulmonary heart disease — is an important one, though variable in incidence in different parts of the world. It has been considerably neglected and is probably more common than most statistical studies at present indicate, especially since it occurs so often in older people who are not frequently seen in general hospitals which treat acute conditions." (11).

The early recognition of right ventricular enlargement and its early treatment, including the treatment of the underlying pulmonary condition may defer more enlargement of the right ventricle. Proper management will prolong the lives of these patients.

#### ROENTGENOLOGICAL DIAGNOSIS

The radiologist's problem in cor pulmonale is to demonstrate right ventricular hypertrophy and prominence of the main pulmonary vessels without concomitant enlargement of the left atrium or ventricle.

The right antero-oblique, and left antero-oblique film, in our experience, have been most rewarding. A 55 degree right antero-oblique is made according to the method of Traeger. This visualizes the pulmonary arc best. Another method is the use of fluoroscopy where the patient is rotated into the proper degree of obliquity to best show the bulging of the pulmonary

conus, pulmonary artery and the hypertrophy of the right ventricle which obscures the space normally present between the posterior aspect of the sternum and the anterior aspect of the right heart.

In early cor pulmonale, on the basis of the study of the above cases, we are able to



4870—H. P., Age 34—(Left anterior-oblique). This position indicates marked emphysema anterior and posterior to the heart with upward bulging of the left ventricle anteriorly.



4870—H. P., Age 34—(Right Anterior-oblique). The pronounced bulging of the pulmonary arc is well visualized.

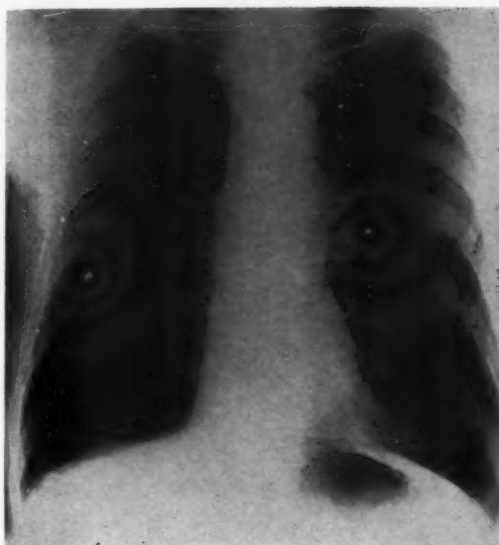
postulate enlargement of the main pulmonary vessels by the elongation and flattening of the upper left segment of the left cardiac border, and then positioning the patient in the right antero-oblique view. Suspicion is aroused with any chronic respiratory condition, such as asthma, emphysema, pulmonary fibrosis, tuberculosis, Collagen diseases, Boeck's sarcoid, carcinoma and bronchiectasis.

In mitral stenosis, in the PA view, a bulge is looked for near the main pulmonary artery, along the left cardiac border below the aortic knob, but in cor pulmonale a definite notch below this segment is present in contradistinction to the heart of mitral stenosis. The heart shadow is widened at the conus and each hilus is prominent due to enlarged pulmonary arteries. A seldom emphasized sign is the greatly increased oval density of the pulmonary trunk at the bifurcation. In the left antero-oblique position the enlarged right ventricle encroaches upon the retro-sternal space, since it is the chamber located anteriorly in this projection. The left ventricular groove which is displaced posteriorly and upward may be seen without difficulty at times, because of the low position of the diaphragms.

#### CLINICAL AND LABORATORY PROCEDURES

There are some clinical and laboratory studies which should supplement X-ray in the diagnosis of cor pulmonale. The development of more cyanosis and dyspnea in patients with chronic pulmonary disease should always lead to the suspicion of cardiac involvement. This is especially true if accompanied by tachycardia. Increased venous pressure, plus increased arm to lung circulation time confirm the impaired right heart circulation. After resection of a lung or a portion of a lung, or following thoracoplasty, the heart may be so displaced in its relationship to the lung and diaphragm that X-ray and electrocardiogram may be misleading. It is in such cases that venous pressure circulation time, and clinical acumen are important.

Catheterization studies showing chamber pressures and oxygen content of the catheterized blood in the various chambers of the heart would settle any of the controversies as to the presence or absence of cor pulmonale. Because this is still impractical in the physician's office or the average hospital, one has to resort to the ex-



12488-J. W., Age 46—(PA view). Bronchiectasis, emphysema. Allergies since childhood. There is evidence of emphysema, pulmonary fibrosis and possible bronchiectasis. The left hilus is elevated cephalad. Again note the elongation and flattening of the upper left segment, as evidence of impairment of the pulmonary circulation.



6485-E. W., Age 36—(Left anterior-oblique). Shows emphysema throughout with upward bulging of the right ventricle.

aminations which are easily available. Simple and informative procedures are circulation time studies, venous pressure studies, with hepatojuglar reflex, and the hematocrit.

#### CIRCULATION TIME STUDIES

We like to combine sodium dihydrocholate and ether in one syringe. The lung to tongue as well as the arm to lung circulation can thus be done at one time. A mixture containing two minims of ether per cc. of saline, is combined with three cc's. of sodium dihydrocholate solution. The end points are sharp with ether and dihydrocholic acid and there should be little error. Repeated tests should be made to establish a base value. Subsequent changes in circulation time are very informative as to progressive right failure, left failure, or combined failure.

#### VENOUS PRESSURE

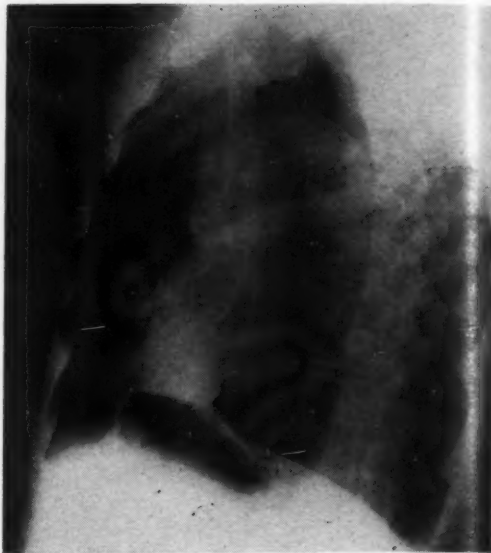
Burch (12) and others found elevated venous pressure in right ventricular insufficiency. The test is simple and definite if combined with the Pasteur-Rondot or hepatojuglar reflex. Base values should be established for each patient. A rise of 2 centimeters on pressure over the liver suggests right ventricular hypertrophy and/or insufficiency.

#### THE ELECTROCARDIOGRAM

Electrocardiography in cor pulmonale and right ventricular hypertrophy has been much discussed. It is the impression of the authors that the electrocardiogram, like the X-ray is either valuable or valueless, depending upon the experience of the interpreter. The right chest leads are very important, but the standard limb leads, the unipolar limb leads, and the unipolar chest leads can be diagnostic. Large P waves in 2-3 and P-AFV are important. Prolonged intrisicoid deflections in V-1 or V-2 and/or Q-Vi or Q-V2, are confirmatory. The presence of "S" waves across the left chest are suspicious of right ventricular hypertrophy.

#### CLINICAL EXAMINATION

Careful clinical examination of the patient is still most important in the diagnosis of right ventricular hypertrophy. One should be suspicious of a shifting P. M. I. toward the xyphoid on inspiration and even more suspicious if P-2 is markedly accentuated and greater than the aortic second sound.



12488-J. W., Age 46—(Left anterior-oblique). Shows evidence of greatly increased oval density of the pulmonary trunk at its bifurcation, and no evidence of enlargement of the left ventricular inflow tract.



12488-J. W., Age 46—(Right anterior-oblique). Confirms the impression seen in viewing the PA view. N.B.: The bulging of the main pulmonary artery.



### AUTOPSY MATERIAL

Larger group studies are becoming available showing the relative frequency of right ventricular hypertrophy. The findings in Arizona have been confirmed by Scott and Garvin (13) and many others. There is real need for a total population study in lung disease concentration areas, such as Arizona.

The case descriptions and X-rays of the cases given below are complete enough without more detail in the body of this paper. It is evident however, that (1) each of these patients has right ventricular hypertrophy, (2) this hypertrophy becomes visible in right oblique films.

### TREATMENT

Many methods of treatment must be a part of the armamentarium of anyone undertaking the treatment of patients with chronic cor pulmonale.

(1) One must treat the underlying pulmonary disease with its complicating allergies, infections and emphysema.

(2) Polycythemia has to be watched for and treated with either periodic venesection or isotopes.

(3) Pulmonary edema requires special diets, use of diuretics, and salt restriction.

(4) Both carbonic anhydrase and cation resins are useful.

(5) When hypotension exists, increased pressure can be attained by the use of one of the ephedrine or dexedrine preparations, or by compression of the abdomen with a belt. We have found the Spencer-Barach-Gordon belt the most useful until now.

(6) Breathing exercises have been of little value in our experience.

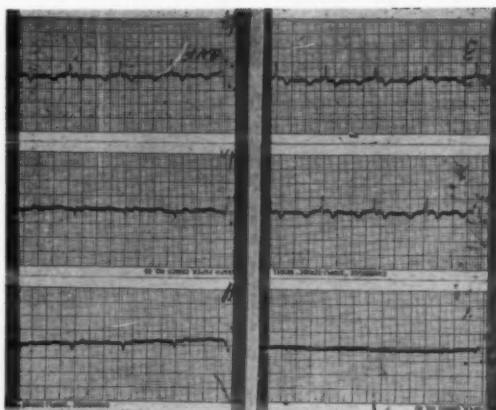
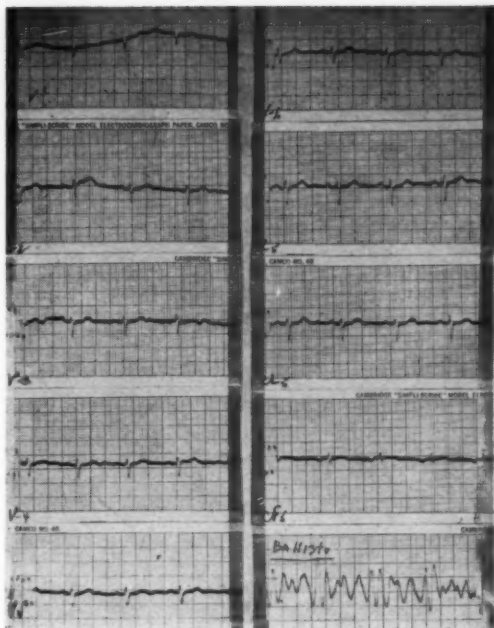
(7) Inhalation of alcohol vapor, with aminophyllin using oxygen as the carrying agent seems to be of real help in paroxysmal dyspnea.

(8) Digitalis is indicated if cardiac failure is suspected.

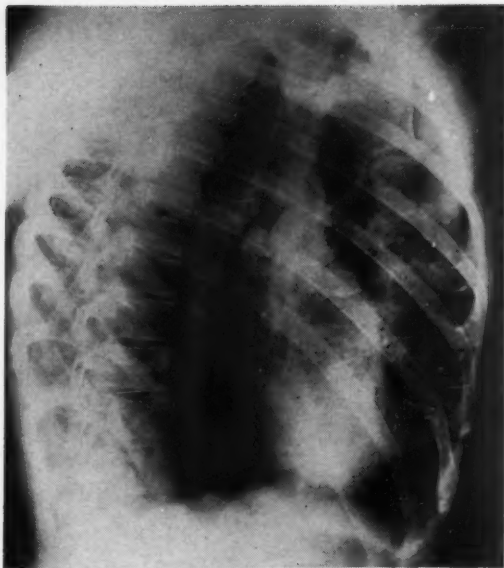
(9) It is important to withhold vaso-dilators because of the possibility of sudden death. This sudden death has been recently explained by Dorday (14) as due to compression of the left coronary artery at its origin between the aorta and pulmonary artery.

### SUMMARY AND CONCLUSIONS

Cor pulmonale has become a major cause of disability in the Southwest area because of dense



This electrocardiogram was selected because it typifies the changes in advanced cor pulmonale as represented by low amplitude in Q(avf), peaking and enlargement of P2, P3, and P(avf) and presence of "S" waves over the entire chest with a delayed intrinsicoid deflection in V1, V2, and V3. The ballistocardiograph shows increased resistance in the secondary circulation which may or may not be diagnostic of pulmonary disease.



6485-E. W., Age 36—(Right anterior-oblique). Shows the marked prominence of the pulmonary arc, or conus.

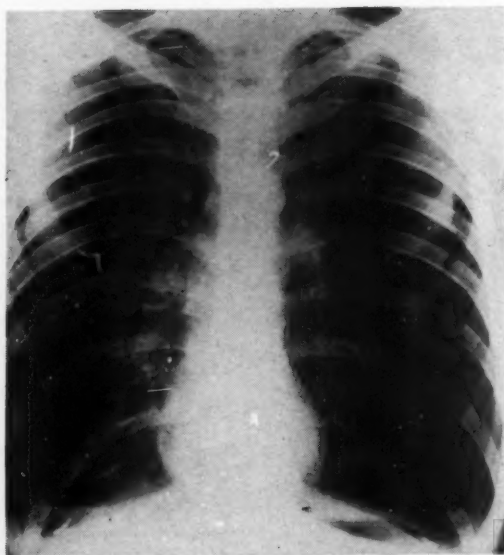
concentration of respiratory cripples. The successful treatment of cor pulmonale is dependent upon its earlier recognition.

EDWARD H. BREGMAN, M.D.  
Chief of X-ray  
Good Samaritan Hospital  
Phoenix, Arizona  
and  
Consultant in Radiology  
Veterans Administration Hospital  
Phoenix, Arizona

MORRIS DEITCHMAN, M.D., FACP  
108 Professional Building  
Phoenix, Arizona

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6485-E. W., Age 36—(PA view). Chronic bronchial asthma, severe emphysema, many years duration. Marked emphysematous changes throughout both lung fields. Severe flattening and elongation of the upper left segment, of the left cardiac border.



## THERAPY OF LIP CARCINOMA

By James M. Ovens, M.D.  
Phoenix, Arizona

**C**ARCINOMA of the lip represents one of the more common carcinomas seen today. It is the most frequent carcinoma associated with the oral cavity. In the treatment of this condition, one is concerned primarily with the defeat of the diseased process and the cure of the patient. Secondly, but however assuming great importance, is the cosmetic result left after the destruction or the removal of the tumor.

To have an excellent cosmetic result while leaving residual tumor is disastrous. By so doing, we lose track of the primary purpose of the therapy, namely the curing of the lip cancer. One allows the secondary factor of cosmetic result to assume primary importance over the cure of the malignancy. This is one of the mortal sins of cancer therapy. Besides endangering the patient's life by diminishing his chances for cure, it eventually causes the patient to have a poorer cosmetic result than if adequate therapy was employed initially.

Lip cancer presents itself in many different forms and is not best treated by any routine method of treatment. To enjoy the best results one must have at his disposal several separate methods of treatment or combinations of any one or more methods of treatment.

Many patients, particularly those who are out of doors a great deal in the sun and wind develop numerous keratotic lesions on the lower lip. These appear as thickenings and may develop into leukoplakia. In others, these thickenings develop longitudinal or transverse crevices that may develop chronic fissures. Many times these are multicentric in origin and may be scattered over the entire lip.

The first clinical sign of malignancy in many of these is the development of a small stellate and punctate retraction of the mucosa. These small lesions are easily treated by "V" excisions of the mucosa and subcutaneous tissue. When they are multicentric, usually a so-called lip peel or lip shave with advancement of the intraoral buccal mucosa anteriorly to meet the cutaneous margin produces satisfactory results. These lesions should not be treated by irradiation whether in the form of interstitial needles, plaques, molds or X-ray therapy. They do not

need such radical treatment.

Once the diagnosis has been established by microscopically proved biopsy, the physician has at his disposal three main methods of treatment of this condition. These methods of treatment are surgery, X-ray and radium. These agents may be used singly or in combination one with the other. The method of treatment to be decided upon depends upon several factors. The more important of these factors to be considered in the selection of the therapeutic agent can be listed as follows:

1. Previous treatment or lack of treatment.
2. Grade of tumor.
3. Position of tumor on the lip or lips.
4. Size of tumor.
5. Age of patient.
6. Occupation of patient.
7. Adjacent structure involvement.
8. Metastases present or absent.

Generally speaking, in my opinion the preferred method for treatment of carcinoma of the lip is by X-ray or radium therapy when feasible. One notable exception to the policy of irradiating these lesions is recurrent tumor in lesions that have been previously irradiated. The reasons for a recurrence in a previously irradiated lesion are:

1. Inadequate total dosage.
2. Poor time-dose ratio.
3. Irradiation of too small a field.
4. Natural radio resistance of the tumor.

As a general rule, recurrent lesions after irradiation therapy do not reflect inadequacy of irradiation therapy, but more so, an inadequacy of the technique being used. Such recurrent lesions must be treated by surgery.

In previously irradiated tumors, the main factor to be considered in treatment is the removal of all the tumor bearing area and irradiated area with a healthy margin of tissue surrounding this. No particular immediate attention should be paid to the cosmetic results. The primary concern is with the removal of the tumor. Post operatively these patients usually end up with remarkably good lips as a result of the various flap procedures used for reconstruction.

When a person has had previous therapy with salves, electric needles and the like, this

therapy can be completely disregarded in the selection of a therapeutic agent. However, when the patient has had previous therapy in the form of X-ray or radium this automatically places this patient in the surgical therapy classification.

Another notable exception to irradiation therapy for lip carcinoma is found in the early, well differentiated, low grade, button type of squamous carcinoma that is sharply demarcated and very slowly metastasizing. Microscopically, this type of tumor shows much keratinization and the formation of many well differentiated pearls. Grossly, these lesions are hard, usually rounded, circumscribed, and sometimes even movable or actually horny in appearance. This lesion is well treated by a simple shield shaped excision of the lip together with at least  $\frac{1}{2}$  cm. of surrounding normal lip with primary closure.

As these lesions become more de-differentiated or anaplastic microscopically, the chance for microscopic extension farther beyond the gross limits of the tumor become greater. It is in these anaplastic type of tumors that irradiation is better employed.

Although the response to irradiation depends to a great deal on the bulk of the tumor it is also an established fact that the more anaplastic tumors are more responsive to irradiation therapy and there is less chance of recurrence along the suture line due to the previously mentioned microscopic spread beyond the gross confines of the tumor. It is in these very anaplastic tumors that no matter how small the initial primary tumor is, irradiation therapy of the entire lower lip is preferred. Even when these very anaplastic tumors are very small grossly, metastases may have already taken place, and in many of these a combined method of therapy must be used.

A presence of a carcinoma in a commissure or on the upper or lower lip near the commissure presents a definite indication for irradiation therapy. Primary and secondary reconstructions of the lip can be well carried out after the removal of more centrally located tumors. With tumors situated this far laterally, reconstruction of the lip is a more difficult procedure, attended with more cosmetic deformity. When the destruction of the tumor can be readily accomplished with X-ray or radium on the commissures, the cosmetic results are excellent.

The larger the tumor, the greater the area

that has to be treated, and the closer the tumor comes to occupying the entire surface of the lip, the greater will be the cosmetic deformity resulting with surgical removal of the lip. In these large lesions, one is usually able to obtain much better cosmetic results with the use of X-ray or radium. The entire lip can be treated, and on the lower lip this can include the quadrangular area from the vermillion border to the lower margin of the mandible with a tumor dose being delivered to this entire area. A very slight cosmetic deformity should result. The only cosmetic defect should be in the defect left from the actual sloughing of the tumor.

In many of these tumors extending over half the vermillion border of the lip, interstitial radium therapy is excellently used. The value of the radium therapy is to develop a tumorcidal dosage throughout the areas treated and producing less cutaneous and mucosal reaction than X-ray therapy given with a comparable tumor dose. It can be delivered over a period of one week, instead of the five or six weeks required for the roentgen dosage by external irradiation.

In the elderly, edentulous person, particularly if the tumor is large, low intensity interstitial radium is used excellently. In a younger person who has teeth present, the necessity of later removing these may produce troublesome infection and complications of post irradiation osteitis and infection from the irradiation. When a person is edentulous, this is one complication that need not be considered. In a younger patient with good dentition, X-ray therapy is given with lead shields being used to protect the teeth. This policy is followed because with the use of radium the dosage is quite high on the contiguous gingiva, and should the teeth have to be later extracted, extreme care must be taken to prevent a post irradiation osteitis in this area.

An important factor to be considered in treatment of carcinoma of the lips in the sunny Southwest, is the occupation of the person afflicted with this condition. Many of these people are out of doors a great deal, and in the sun and wind a high percentage of the time. Particularly if the patient is young and there is any doubt what therapy is to be used, surgery should be given the preference. With surgery used on these patients there is less chance of future reaction or irradiation ulceration when



the condition is aggravated by prolonged sunlight. Even with the most slowly given and best therapy ulcerations do occur after prolonged and excessive exposure to the sunlight. This is particularly true if a large area has been irradiated.

Involvement of the adjacent mandible by direct extension of the tumor automatically classifies the patient as a candidate for surgical excision of the lesion. The cure of lesions that have invaded the mandible is very low by irradiation. The best results are obtained by surgical excision.

The treatment of lip carcinoma metastatic to the cervical lymph nodes is practically always by surgery. The performance of prophylactic radical neck dissection in carcinoma of the lip is not indicated. It has been demonstrated, that of the patients who are free from lymph node involvement at the beginning of therapy, less than ten percent develop lymph node metastases after adequate therapy to the original site(1). If lymph node metastases do develop, the treatment becomes primarily one of surgery in the form of radical neck dissection. The solitary involvement of a submental or submaxillary node in a relatively low grade tumor can be treated by unilateral or bilateral superhyoid neck dissection. As a rule, complete radical neck dissection should be done, however. This is particularly true with the more anaplastic tumors.

Lip carcinomas that metastasize to the neck are, as a rule, of the more malignant nature, and complete radical neck dissection is usually indicated. In the extreme anaplastic tumors where bilateral cervical metastases have taken place, or where the lower cervical nodes or supraclavicular nodes are involved, interstitial radium therapy or X-ray therapy may be used in the treatment of these nodes. However, I believe the treatment of cervical metastases by irradiation is limited to this group.

Occasionally, and particularly in the larger lip tumors, the combination of surgery and irradiation

therapy may become necessary. This may be necessary with very large, bulky, or exophytic tumors, or with tumors where metastasis has taken place. If these tumors are very exophytic and project out a great deal from the skin, it may be advantageous to remove the bulk of the tumor by electro-surgical therapy and to treat the base of the tumor by irradiation therapy of some variety. Many times these tumors are quite superficial and look a great deal worse than they actually are. After removal of a great bulk of the tumor with either the cold knife or diathermy, the treatment of the tumor base by irradiation is much simplified, and if radium is used, a much simpler one plane implant can be done. If external irradiation is used, the depth dose is no problem.

IN SUMMARY, I would like to say that lip carcinoma is best treated by X-ray, radium or surgery, depending upon the factors just mentioned. There should be no routine treatment.

The important factor in surgical treatment is the complete excision of the tumor and a generous area of healthy surrounding tissue. This is best judged by gross clinical experience and by frozen section microscopic examination at the time of surgery. If the tumor is treated by a low intensity interstitial radium therapy, one should aim at a total dosage of between 6000 and 7000 gamma roentgens being delivered over a period of six to seven days. When X-ray therapy is used, the aim of the therapy should be to irradiate an area at least as large as would be removed surgically, and to deliver a total dosage of at least 6000 roentgens in a period of time extending from four to six weeks.

The prognosis for cure is good in these tumors, and excellent cosmetic results can be obtained. One should consider the cure of the tumor of primary importance with the cosmetic result only of secondary importance.

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**ASCITES**

By Mahlon Delp, M.D.  
Kansas City, Kansas

**I. Historical**

Term introduced by Trevisa in 1389.

Derivation of term — Greek *askos* meaning bag.

Egyptians 1500 B.C. recognized and associated collections ascitic fluid with liver disease.

Erasistratus 250 B.C. noted occurrence of ascites with damaged liver.

Celsus 20 B.C. recommended abdominal paracentesis.

Paul of Aegina treated ascites by drainage thru copper tube.

**II. Ascites — Clinical Syndromes**

Congestive Heart Failure (Hepatic Congestion) Mitral Stenosis with tricuspid insufficiency.

Constrictive Pericarditis

Caval Obstruction

Cardiac Cirrhosis

Laennec's cirrhosis

Acute liver injury

Portal thrombosis

Carcinomatosis

Myxedema

**III. Ascites: Experimental Production**

Cirrhosis from embolic or toxic injury.

Carbon tetrachloride

High fat, low protein diets

Portal embolism with barium

Radioactive gold

Liver engorgement

Constriction of vena cava just above hepatic veins.

Ligation of portal vein with plasmapheresis.

**IV. Ascites: Formation Factors**

A. Principles of fluid exchange  
(Starlings Principles)

Hydrostatic pressure in capillary 32 mm Hg.

Hydrostatic pressure in venule 12 mm Hg.

Osmotic pressures

Crystalloids

Colloids

Tissue tension

Capillary permeability

Ascites: Factors in formation of fluid.

B. Portal hypertension

Plasma proteins

Intra-abdominal tension

Sodium and water retention

Hormonal influences

Venous pressure elevation (volume receptor mechanism)

Ascites: Formation Factors

**C. Portal hypertension**

Measurements of portal pressure difficult — direct, or catheter.

Normal pressure 15-25 cms. water.

In Laennec's Cirrhosis may be 20-50 cms. water.

Usual increase could result in only mild increase in splanchnic pressure.

Presence of detachable portasystemic venous communications may actually be associated with a lower pressure.

Patients with high portal pressure may have no ascites or vice versa.

Portal occlusion or constriction with plasmapheresis and sodium administration does result in ascites.

Portal hypertension then contributory but not dominant factor.

Ascites: Formation Factors

**D. Plasma proteins**

Effective colloidal osmotic pressure exerted by plasma proteins especially albumin.

Protein in ascitic fluid electrophoretically similar to plasma proteins but slightly lower in content.

Particularly true in congestion of liver — protein value varies from 0.5 - 4.5 gms. per cent.

Crude correlation between presence of ascitic fluid and plasma albumin values of 3.0 gms. per cent or less.

Albumin intravenously exerts little effect clinically.

Albumin intraperitoneally while resulting in no increase in ascitic fluid is followed by increase in plasma albumin level.

Ascitic fluid protein then does not seem to exert great effect in retaining ascites.

Experimental ascitic dogs given low protein intake with salt collect fluid rapidly.

Experimental animal given high protein, low salt loses fluid.

Plasma and ascitic proteins are not dominant in control of ascitic fluid collection.

Plasma protein osmotic pressure is of second

dary importance.

#### Ascites: Formation Factors

##### E. Intra-abdominal tension.

Pressure may vary from 20-50 cms. of water.

Rapidity of collection factor in high tensions.

Might reason that would retard ascites formation.

Does contribute to edema of extremities by pressure on vena cava — may influence general venous pressure.

Possible effect from pressure on portal vein.

Actually with slow collection of fluid little elevation of pressure.

Paracentesis often results in more rapid formation.

Influence must be minor.

#### Ascites: Formation Factors

##### F. Sodium and water retention.

Recognized factor in edema in general.

Scanty output of sodium in urine of patient with ascites — 1-5 meq./L on normal Na intake.

Serum sodium levels not increased.

Similar phenomena seen in cardiac patient with congestive failure.

High protein low sodium diets followed by slow increase in sodium output, loss of ascites and gradual increase of serum sodium levels.

Eventual return to normal sodium metabolism.

Same phenomena seen in experimental ascitic animal.

Sodium very important in pathogenesis ascites.

#### Ascites: Formation Factors

##### G. Hormonal control of sodium and water excretion.

Sodium excretion not controlled by renal blood flow nor glomerular filtration rate.

Sodium excretion by renal route controlled by renal tubular resorption.

Kidney itself does not determine when and how much sodium to save. It responds to some distant exciting or trigger mechanism, i.e. cirrhosis, venous engorgement, hepatic congestion.

Adrenal cortical hyperactivity suggested.

Adrenal steroids ordinarily exert sharp influence of sodium excretion and urine output.

In experimental ascitic animal steroids exert little effect. Adrenalectomy clears ascites.

Cirrhotic patients excrete little sodium in sweat and saliva.

Similar phenomena seen with large doses of DCA.

Antidiuretic hormone of posterior pituitary may act directly on renal tubule.

#### Ascites: Formation Factors

Liver may in failure be unable to inactivate hormones of the adrenal and pituitary.

VDM (ferritin) released by the damaged liver may influence urinary output.

Sodium retention of unquestionable importance in ascites formation.

#### Ascites: Formation Factors

##### H. Venous Pressure Elevation

Critical elevation of venous pressure said to influence sodium excretion before edema appears?

Constriction of portal vein does not produce such.

Constriction of vena cava below diaphragm does not produce such.

Congestion of the liver regardless of how produced does so influence sodium excretion.

#### V. Ascites: Sequence

Hepatic congestion with circulatory failure. Liver cell damage and death from anoxia and nutritional lack — diffuse hepatic fibrosis.

Transudation of fluid and protein into tissue spaces of liver.

Mechanism for retention of salt and water by kidney triggered.

Liver lymphatics engorged with proteinous fluid weep into the peritoneal cavity.

Loss of plasma proteins into ascitic fluid makes more critical vicious circle.

#### VI. Ascites: Treatment

##### A. Relieve heart failure.

Rest.

Digitalis.

Diuretics.

Salt restriction.

Fluid balance.

Mitral valve surgery.

Removal constricting pericardium.

##### B. Relieve liver failure.

Rest — bed.

Digitalis?

High protein, high carbohydrate diet.  
 Adequate vitamins.  
 Salt restriction.  
 Diuretics.  
 Fluid balance.  
 Paracentesis?  
 Shunt surgery?  
 Hepatic artery ligation?  
 Steroid therapy??

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## THYROID THERAPY IN WOMEN

By Joseph B. Raddin, M.D.

Phoenix, Arizona

**T**HE MOST common endocrine gland dysfunctions encountered in medical practice today are those of the female endocrine gland system: the anterior pituitary, the thyroid, the two ovaries and the two adrenal cortex glands. The anterior pituitary is the great 'regulator' of thyroid, ovary and adrenal cortex function. These glands are sometimes referred to as the 'target' glands of the anterior pituitary. It is impossible to study thyroid function without considering the effect of the hormones of the other female sex endocrine glands on thyroid gland function.

### THE ANTERIOR PITUITARY GLAND HORMONES

It is today, generally accepted that the anterior pituitary gland secretes at least six distinct hormone principles: —

1. FSH — follicle stimulating hormone which stimulates development of follicles in the ovary and the regulation of secretion of estradiol by the ovary.

2. LH — luteinizing hormone acts on the ovary after ovulation to stimulate luteinization and to promote secretion of progesterin.

3. LTH — luteotropic hormone, in conjunction with estradiol, stimulates proliferation of the mammary milk glands and ducts and initiates milk secretion by the mammary glands postpartum. It has also been named prolactin and lactogenic hormone. LTH is also responsible for the final development and functional activity of the corpus luteum.

4. TSH — thyroid stimulating hormone which stimulates thyroid activity and release of its hormone thyroxine and related hormones.

5. ACTH — adreno-cortico-tropic hormone which stimulates adrenal cortex secretion of its hormones.

6. Growth hormone — which causes striking effects in experimental animals but little effect in humans. It has been stated to be identical with insulin.

Each of these anterior pituitary hormones stimulates its particular target gland to functional activity and secretion of its appropriate hormone. To prevent over-secretion of a hormone by a target gland, anterior pituitary secretion of the trophic hormone is normally slowed and stopped when the amount of the

target gland hormone has reached normal concentration in the blood. Anterior pituitary function can thus be compared to a thermostat on a furnace.

Whether orally or by injection in physiological dosage, the therapeutic effect of thyroid extract and of the steroid hormones, estrogen, progesterin, testosterone, cortisone and other adrenal cortex hormones lies in replacement of a deficiency of the particular hormone. Ordinarily such therapy tends to depress or suppress temporarily the function of the particular endocrine gland while its hormone is being administered. Such therapy is here called SUBSTITUTION therapy.

STIMULATING therapy may be defined as increasing anterior pituitary function so that its trophic hormones are secreted in normal or adequately balanced amounts. Such therapy enables the patient's own ovaries, thyroid and adrenal cortex glands to secrete their own hormones in normal amounts. When successful, long periods of remission of symptoms of deficient secretion of target gland hormones follow. In young women cure is often obtained.

A brief review of female endocrine gland function will clarify some of the remarks which follow.

The ovaries and testes are now believed to metabolize cholesterol to secrete both estradiol and testosterone in proportionate quantities in each sex(8).

The adrenal cortex can apparently metabolize cholesterol to cortisone and the several other cortisone-like hormones as well as estradiol and testosterone or related hormones in each sex(8).

The thyroid gland is believed to secrete only thyroxine by metabolizing iodine from the blood. The thyroid is only indirectly concerned with cholesterol metabolism.(1).

### THYROID GLAND FUNCTION.

Thyroid gland function is normally directly stimulated by TSH. Indirectly, thyroxine secretion and basal metabolism is influenced by estrogen blood levels in both males and females(2). TSH stimulates thyroid gland secretion of thyroxine until the desired thyroxin level in the blood is reached. This blood thyroxine level then slows or stops TSH secretion until the blood level is again lowered to the point

at which TSH is again secreted. High estrogen blood levels apparently permit a higher blood level of thyroxine before TSH secretion is reduced or stopped. Experimentally the thyroid gland has a low rate of spontaneous function when TSH is wholly lacking as indicated by a PBI value of 3 to 4 mcg. %. Following total thyroidectomy PBI values are often 1 or 2 mcg. %. Protein Bound Iodine values are believed to be a direct measurement of thyroxine content of the blood. The source of this thyroxine following total thyroidectomy is not presently known.

TSH action on the thyroid gland is two-fold. First, it stimulates hypertrophy and hyperplasia of the secretory epithelium. Second, it stimulates synthesis, storage and release of thyroxine(1). Iodine therapy tends to increase the synthesis and storage of thyroglobulin and temporarily to inhibit the release of thyroxine into the blood. A high level of serum thyroxine as measured by the PBI test tends to inhibit further release of thyroxine from the thyroid gland by inhibiting TSH secretion.

Definitions of simple goiter, myxedema and hypothyroidism will be reviewed:

Simple goiter is due to an absolute or relative lack of iodine in the diet. When the deficiency is mild, simple goiter is not accompanied by alteration of thyroid function.

Myxedema is caused by complete or almost complete lack of thyroid function. Mild degrees of myxedema should be labeled hypothyroidism because by definition there can be no mild degree of complete or almost complete lack of function. True myxedema is rare. Hypothyroidism is common. Occasionally myxedema is secondary to lack of TSH, the so-called pituitary myxedema.

In hypothyroidism there is a depression, rather than a cessation of thyroid gland function. It is probably overlooked as a diagnosis more frequently than any other endocrine gland dysfunction. The symptoms are of the same nature as in myxedema except for the edema but they are less severe.

#### GENERAL PRINCIPLES OF THERAPY OF THYROID DYSFUNCTION.

##### 1. Iodine.

Iodine is an essential constituent of the thyroid hormone. Three factors apparently influence the amount of iodine used (uptake of iodine) by the thyroid gland. First, simple or colloid

goiter will take up much more iodine from the blood than will the overactive gland of hyperthyroidism. Second, the blood level of inorganic iodine depends on iodine intake in the diet. Third, TSH regulates the speed and completeness of the conversion by the thyroid gland of iodine into thyroxine(3).

##### 2. Thyroxine.

Thyroxine can be given subcutaneously, intramuscularly or intravenously. Its irregular and incomplete absorption from the gastro-intestinal tract makes it less useful than thyroid by mouth(3). It is also more expensive.

##### 3. Thyroid, U.S.P.

The organic iodine content of thyroid is the official index of potency.

Therapeutically thyroid is slow acting, the full effect of a single dose is not manifest for about a week, after which its action gradually diminishes. The slow action of thyroid makes daily dosage cumulative so there is no advantage in subdividing the daily dose. A thyroid tablet does NOT make a normal or hypothyroid individual 'nervous' a few hours following ingestion. It is not possible to gauge accurately the effect of a given dosage of thyroid until it has been taken for ten to fourteen days. Because many of the actions of thyroid are trophic on such structures as the skin, nails and hair, several weeks or months must elapse before the full effects of therapy can be observed.

Paradoxically, the dosage of thyroid varies inversely with the severity of hypothyroidism. In myxedema, initial dosage should be 1/10 grain daily. The more severe the deficiency, the more sensitive is that individual to thyroid medication. In mild or moderately severe hypothyroidism without myxedema, it is usually good practice to start therapy with a daily dose of 1 grain daily. Individuals with normal thyroid gland function can usually tolerate twelve to fifteen grains of thyroid daily before noting manifestations of overdosage. The normal thyroid-anterior pituitary axis is capable of tremendous compensatory inhibition when thyroid is administered(3).

Thyroid is of limited value in the treatment of obesity. As an adjunct to diet and other measures it helps to maintain morale and physical strength. It also aids body water metabolism(3)(4).

A therapeutic trial of thyroid is the last

resort of appeal when the diagnosis of hypothyroidism is uncertain. It should not be undertaken casually(3)(7). It should, however, be undertaken more frequently than it is in chronically ill and nervous women.

#### 4. Simple goiter.

Iodized salt prevents simple goiter. Small daily dosage of potassium iodide or Lugol's solution for a few months will effectively shrink an adolescent goiter. Fractional dosage of thyroid is probably preferable.

#### 5. Myxedema.

Cautiously increasing dosage of thyroid from 1/10 grain daily as tolerated is the only presently known substitution therapy for true myxedema(3).

#### 6. Cretinism.

Congenital myxedema is rare. Thyroid must be started during the first few months of life to obtain any real benefit. It must be continued for the lifetime of the patient. Results of therapy are poor.

#### 7. Hypothyroidism.

Therapy for hypothyroidism has traditionally been thyroid. The dose required is larger than in myxedema, the tolerance to overdosage is greater, and the variability in requirements from one patient to another is much wider(3)(4). However, a true hypothyroid individual is unable to tolerate the ten to fifteen grain daily dose which the euthyroid person can tolerate.

When the thyroid gland is unable to respond to TSH stimulation, thyroid substitution therapy is mandatory.

If the anterior pituitary gland is unable to secrete adequate amounts of TSH, thyroid substitution therapy is mandatory.

Neither the basal metabolic rate, blood cholesterol and cholesterol ester values nor any other laboratory procedures are able to establish diagnosis in most cases of mild hypothyroidism. Nevertheless these tests, as well as the PBI and radio-active-iodine-uptake tests, all give information of value in deciding on therapy.

The PBI-TSH test is most useful to differentiate primary from secondary hypothyroidism. A clear and concise statement about these diagnostic questions is quoted from Thompson(9): —

"An interesting related problem is the difference in the manifestations of hypothyroidism between the primary type (inability of the thyroid gland to respond to TSH stimulation) and the type that is secondary to hypo-anterior-

pituitarism (lack of adequate amount of TSH secretion by the anterior pituitary gland.) Patients with the secondary type have little or none of the characteristic edema, they do not gain weight and their skin is soft and delicate rather than dry and scaly. Both types of patients have hypothyroidism but the clinical manifestations are different.

"In patients with the primary type, the administration of desiccated thyroid eliminates all of the manifestations of the disease, but in patients with the secondary type the administration of desiccated thyroid corrects only some of the patient's symptoms. Those that are not corrected are presumably related to other glandular deficiencies secondary to the hypothyroidism"(9).

The therapeutic test using thyroid is the court of final appeal for the diagnosis of many cases of hypothyroidism(3)(7).

#### 8. Thyroid Stimulating Therapy.

When thyroid is given at a dose of three grains or more daily to a hypothyroid or euthyroid person(4), it is believed the blood level of thyroxine is such that the anterior pituitary does not receive any stimulus to secrete TSH. Therefore, three grains or more of thyroid daily is substitution therapy. While thyroid will relieve all the symptoms and complaints which are due to primary hypothyroidism, such therapy is not curative and must be continued indefinitely.

Normal thyroid function can be stimulated in one or several ways, providing only that the thyroid gland is able to respond to TSH stimulation. This ability is easily determined by the PBI-TSH test. To 'cure' hypothyroidism, normally adequate secretion by the anterior pituitary gland must be attained to insure the steady liberation of thyroxine stored in the thyroid gland as well as to increase its thyroxine manufacturing capacity.

Primary hypothyroidism is apparently comparatively rare, at least as determined by the PBI response to TSH test stimulation. Pregnant mare serum hormone has been demonstrated(5) to have the ability to stimulate anterior pituitary secretion of TSH for long periods. Since hypothyroidism is commonly of the secondary type, pregnant mare serum hormone stimulation of the anterior pituitary often 'cures' or gives prolonged remission of hypothyroidism.

One method to stimulate thyroid gland func-



tion is to prescribe a daily dose of  $\frac{1}{2}$  or 1 grain thyroid. This dose often seems to 'rest' the gland. When, after a few months of medication, the thyroid is gradually reduced and finally stopped, it is common clinical experience for the thyroid gland to resume normal function.

A second method is to stimulate ovarian function with 0.10 mg. stilboestrol daily(10). There is a close relation between estrogen blood level and thyroid gland function. Studies(6) have demonstrated "that the concentration of serum precipitable iodine SPI (which is identical with PBI), a reliable index of circulating thyroid hormone, increases in men and women during the administration of estrogen. . . . Normal function of the pituitary and thyroid are necessary for the reaction to occur." Briefly, increasing ovarian function increases thyroid function.

Finally, after a woman has been 'primed' with thyroid and stilboestrol, pregnant mare serum hormone in adequate dosage and properly timed will stimulate yet more thyroid function.

#### CLINICAL EXAMPLES OF THERAPY FOR HYPOTHYROIDISM.

A clinical application of thyroid substitution therapy is illustrated by pregnancy. A woman who has needed two grains of thyroid daily to maintain normal health and perhaps to overcome sterility, must by the fourth month of pregnancy ordinarily reduce the dose to one grain daily. By the seventh month it must usually be stopped. Failure to do so commonly induces symptoms of hyperthyroidism. This effect is believed due to the activity of the fetal thyroid. Six weeks or more following delivery of her baby, the same dose (in this example two grains daily) of thyroid that was required before conception will be needed to maintain normal health.

Therapy for adolescent acne vulgaris will illustrate the three methods of stimulating thyroid gland function.

First, thyroid gr. 1 daily for several months will regularly cure mild acne in that remission continues long after the thyroid has been stopped.

Second, when the acne is more severe and good relief is not obtained with thyroid alone, adding 0.10 mg. stilboestrol daily to the thyroid will usually be curative in young girls after several months administration.

Third, should severe acne of long duration with keloid and scar formation resist this 'priming' therapy, pregnant mare serum hormone is then given. The thyroid and stilboestrol is continued until remission of the acne.

For many years I have accumulated clinical evidence that pregnant mare serum hormone effect in girls and women before their menopause is more than FSH alone. Given in adequate dosage at properly spaced intervals, it has a slow but prolonged stimulating effect on both ovarian and thyroid function(5). It has also been demonstrated by basal body temperature charts to induce regular ovulation beginning three or four months after intravenous administration of sufficient hormone. I know of no method to determine what constitutes 'adequate dosage.' Nor have I yet encountered a case of adolescent acne vulgaris which failed to respond to one or more forms of therapy suggested. Since the therapy can be stopped and the acne remain in remission, this therapy is stimulating rather than substitution in type. The latter would have to be continued indefinitely to maintain 'cure.'

#### SUMMARY.

Hypothyroidism is probably the most common endocrine gland disorder encountered in general medical practice. It is seldom considered as a diagnosis because moderate degree of underfunction which causes sufficient ill health to induce a woman to seek relief cannot be identified by any laboratory procedure. General principles of thyroid therapy are discussed. Two examples of thyroid therapy illustrate these principles.

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## CANCER RESEARCH

By Darwin W. Neubauer, M.D.

Tucson, Arizona

**T**HE DEVELOPMENT of research with reference to the cancer problem has paralleled the development of the American Cancer Society. This is not only because the Cancer Society has functioned as a collecting agency and an educational agency but possibly the effectiveness of this organization in showing the interest and needs of the American public has stimulated Congress to bring about added appropriations from public funds which are now being quite instrumental in advancing this field.

One hardly knows how to approach a review of this sort. As to the status of research and knowledge, in an extensive field, one cannot help but feel that while the answer cannot be given today we may be in a position very comparable to that in the '20s just prior to the discovery of insulin by Banting and Best. It is reported that two medical students upon finding sugar in their urine committed suicide within the following week yet within one week of their drastic action, Banting and Best reported the discovery of insulin, an enormous step forward in the control of that vicious disease, diabetes.

My interest in the cancer problem and cancer research dates back to working as an extern at Barnard Free Skin and Cancer Hospital in St. Louis in 1937. Later I returned to this hospital as a resident in surgery and with the start of World War II in 1941 those of us interested in this field were dismayed that the total expenditure for cancer research in the entire United States was only equivalent to the cost of two Grauman fighter planes or approximately \$150,000. In Barnard Hospital alone we had only three full time research individuals, all of them refugees on a very limited stipend and only two additional part time research fellows.

At the time of the development of the American Cancer Society in 1946, less than \$1,000,000 was being spent annually for cancer research. By 1955, 10 years later, the American Cancer Society had developed a program that brought about a collection of funds of \$27,000,000, approximately \$7,000,000 of this devoted to re-

search in the field of cancer. This is an impressive advance and yet a rather poor comment upon our civilization when one considers that one in four of all Americans living today will develop cancer and of these we will cure only one in three. In Arizona alone we are losing approximately three patients per day by death from cancer. During the past ten years the deaths in this State have risen from approximately 6,000 to 8,000 but during that time deaths from cancer have risen from 418 to 979. Cancer deaths more than doubled in contrast to the limited increase in overall deaths attributable in part to the increase in our population.

It is a rather poor comment upon our civilization, when the tobacco industry alone is spending approximately \$60,000,000 a year for advertising, we are spending only \$55,000,000 a year for the total research program in this country. Approximately \$7,000,000 derives from the Cancer Society, \$48,500,000 from appropriations by Congress to the National Cancer Institute. An appalling comparison is that this figure devoted to cancer research is only twice that being spent yearly for nail polish by the American women. Or, to drop back to this great foe of ours, possibly one of the prime suspected causes for an increase in cancer in this country, the tobacco and tobacco products industries are receiving from the American public 100 times the expenditure that is going into cancer research. \$5,250,000,000 per year is spent for the purchase of tobacco items.

For the year 1957 Congress has appropriated to the National Cancer Institute \$48,500,000 for research and an additional grant of \$30,000,000 yearly for the next three years for the construction of research facilities. You will note that this amounts to approximately \$1.00 expended per year for cancer research for each of the potential 40,000,000 cancer cases in the United States.

Not very long ago, I was more optimistic that we would have an early answer to the cause of cancer, and with it, the likely cure. One year ago Dr. Cameron pointed out that we had the pieces of a jigsaw turned face up and now all that remained was putting the pieces together. As we have attempted to put

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the pieces together it becomes quite evident that it is not a matter of putting one jigsaw puzzle together but possibly we have one to three hundred jigsaw puzzles, all mixed. Now the facts that have been established must be relegated to the specific cancer concerned and not dumped into one pot as applicable to all malignancies. Cancer is many diseases, having one factor in common — tumor formation. If it were a single disease the next quarter of a century would certainly yield a specific cure. But we are dealing with hundreds of forms. Some have been cured, others will respond to treatment in the near future, while others may evade cure for many years.

To understand the problem or the research necessary many facets must be pursued. 1. As to the causes, a consideration of the hereditary factor and undoubtedly the environmental factors. 2. As to forms of treatment, the role that chemicals may play in cure. 3. The possibility of development of antibodies or an immunity by the host. 4. The role of hormones in etiology and cure. 5. The status of our presently accepted modes of treatment such as surgery, irradiation, X-ray, radium and the radioactive isotopes.

Bearing in mind that we are pursuing the cause and treatment of many varieties of tumors, cancer research becomes a probe into the fundamental processes of life, a search to determine how cancer can be prevented, how it starts and once it has started, how it can be halted or the process even reversed.

This has led to two fundamental schools of thought for investigators. One asserts that the most effective way to speed this conquest is through fundamental research, i.e., investigation into growth processes. Secondly, we have the school that supports the exploitation of any approach that has already yielded means to combat other important afflictions of man. To attain a coordinated research program, a balance must be approached between these two concepts — one the highly speculative approach and the other the ultra-conservative attack.

To start with an investigation of the causes of cancer there are many aspects and not all call for laboratory research. Studies are being carried out as to environmental cancer. Our present industrial civilization seems to have developed over 400 chemical substances that are carcinogenic. The air we breathe contains

many hydrocarbons that will cause cancer. Among these are coal tar products, soot, incompletely combusted gases and oils, cigarette smoke and smog.

Carcinogenic agents may cause cancer only in specific organs of the body as for example:

Arsenic, tar, cresote, crude paraffin oils, X-rays, radium and sunlight can and do cause skin cancers so evident in sailors and farmers. The increased incidence noted in skin cancer through Florida, Texas, Arizona and California has been ascribed to sunlight. The various sprays, particularly those containing arsenic as used by the vineyard workers in France, will cause skin cancer.

Cancer of the lung can be precipitated by asbestos, chromate powders, nickel carbonyl, tar fumes, ionizing radiation as noted in the pitch-blend miners of Czechoslovakia. We, in the United States in recent years, have become concerned with the marked increase of cancer of the lung in the cigarette smoker.

Nickel carbonyl, isopropyl oil and radioactive dust and gases are accepted causes for cancer of the nasopharynx and sinuses.

Aromatic amines as used in the synthetic dyes, cause cancer of the bladder. This is noted particularly in the synthetic azo dye industries of Switzerland and Germany. In Egypt a problem is presented by the bladder parasite, *shistosoma*, which appears to cause bladder cancer.

Radium and mesothorium produce bone sarcoma. This was noted following World War I in the women who painted the radium dials of the early luminescent watches and pointed the brushes with their teeth and lips.

Benzene and radiation cause leukemia. It is well known that leukemia is much more common among radiologists, possibly eight times as frequent among radiologists as in the M.D. group in general. The too-hot clay pipe has caused many cancers of the lips, particularly in Holland. In the Moslem world, with repeated shaving of the skull with a blunt instrument and its associated irritation, they have an unduly great number of scalp cancers. In the Philippines, mouth cancer seems to be caused by the leaf-wrapped betel nut. The natives of India have numerous skin cancers from the constant chafing of fibrous cloth.

These are some of the hazards and you will note that they are all constant irritants, but

only in the form and amount in which they are handled in the industrial processes or for a long period of time. It must be noted that it usually takes an exposure to these various irritants between 1/8th and 1/12th of the life cycle of the organism to precipitate a malignancy.

Recently, at the International Union Against Cancer held in Rome, many of our present day contacts were considered as possible or potential cancer hazards, including cosmetics, food wrappings and food preservatives. I mention these purely as potential and not proved factors of cancer production.

The listing of environmental factors may have taken you far afield from the specific research in cancer but our problem is this: What advances are being made in cancer — in the determination of its causes, prevention and treatment? In seeking an answer the environmental factors and possibly the geography of cancer are significant. Recently a geographical pattern has been noted. There is a distinct pattern following the Appalachian range from Alabama to New England that shows a surprising incidence of cancer. There are other patterns of unusually high cancer death rates in Florida, Kentucky and central Texas. There is one pin-point area around Hagarstown, Maryland where there are particular houses with an unusual record of multiple cancer deaths through the years.

As to the more generally accepted methods of research — recent studies pursuing the innermost secrets of the cell, and applying them to the two established methods of curing cancer — radiation and surgery — have come up with some basic concepts, but actually with few answers.

With the electro-microscope, molecular particles have been isolated, particles that play a vital role in cancer reproduction. Chromosomes and genes are yielding secrets of their control of growth and these may be fundamental. To date, only three rare kinds of cancer have been found to be transmitted as inherited characteristics. They are:

1. Multiple polyposis of the colon, which is a pre-malignant lesion.
2. A retinoblastoma, which is a cancer of the eye.
3. Xeroderma pigmentosa, which may become a skin cancer.

However, there is more to the heredity factor than this would imply. We know that 2% of all women will develop cancer of the breast. Yet, 7% to 8% of the close blood female relatives of breast cancer patients will develop cancer of the breast.

Recently, and of great importance, research personnel have developed the technique to cultivate human, as well as animal, cancer cells artificially in another animal, in the embryo of the fowl egg, or in the test tube. This will give us the chance to do with cancer cells almost the same things that have been done with bacteria, and so, may bring about chemical control of cancer. It certainly will bring about added knowledge as to the viruses and their relation to malignancy.

It is evident that one virus or another may play a role in causing cancer. In other cases there is an antagonistic action by the virus to a malignancy, for in some animals a cure of cancer has and can be brought about by the inoculation with a virus. Years ago, Rhou isolated a virus which caused chicken sarcoma. More recently a virus has been found which will cause leukemia in adult mice. More important however, a vaccine can be made which will cause immunity to this leukemia in adult mice; an immunity that is, in the animals that are otherwise susceptible.

Immunity is not a new concept to you in most diseases. It may be a questionable concept in cancer. You have been aware of it in the temporary resistance transmitted passively by the modified protein component, gamma globulin, in measles. It can be stimulated actively, as in smallpox vaccination, tetanus and typhoid inoculation.

There is good evidence that in some men a specific immunity or resistance does develop to spontaneous cancer. To date, we have been able to provoke little of this resistance by vaccination in man. However, evidence of this resistance to cancer by certain individuals can be found in a number of cases:

1. Where local deposits of cancer cells are found by accidental discovery at the time of surgery, to exist and yet have shown no evidence of spread.

2. Where cancer which is already known to be invasive to the individual may suddenly show a very slow development or even become quiescent.



3. In cases of desseminated cancer that have been noted to regress.

4. Dr. Rhoads of the Sloan-Kettering Institute for Cancer Research believes he has "definite proof" of special immunity against malignancy in humans. His fundamental finding is that:

A. Cancer cells implanted into a normal patient will be "sloughed off in a rejection action."

B. But, if the cancer cells are implanted into volunteers already afflicted with cancer they will grow.

Now in these cases a specific circulating antibody has not been found, but a chemical component of fat has been found which exists almost exclusively in cancer tissue. It is capable of inducing an immune reaction when injected into animals of other species. This determination, in itself, of a unique chemical component of the fat of cancer cells, indicates the possibility of 1. An enhancing effect upon the defense mechanism in the body, or 2. A diagnostic test for cancer; a test for those minute foci of early cancer which cannot be detected clinically. While antibodies have been found in the blood of animals with cancers, they are minute in amount and ineffective to control the tumor. However, by a combination of immunology and drugs, the possibility does exist of increasing these antibodies artificially. This has been done with antibodies against viruses and bacteria.

Not only do we have to consider the possibility of the immune reaction, or the antigen-antibody system, but as noted previously, there are certain cancer destroying viruses. Virus have been found which will cure transplanted cancers in animals and certain viral strains will effectively destroy human cancer in the test tube. To date, they have not been successfully applied to clinical cancer cases in man.

Further, from a chemical aspect, human cancer tissue contains certain protein components which are not present so frequently nor in so great an amount in normal tissue. This protein component can provoke immune reactions. Secondly, certain protein components are absent in cancer tissues although they are regularly found in normal tissue. Here then, a chemical difference is noted leading us to the possibility that a chemical may be found which will affect the specific protein alone and so be damaging to the cancer cell alone.

If so we may take a long step forward in the treatment of this group of diseases.

The finding of differences in the chemistry of the cancer cell, a unique component in the fat and an altered protein pattern may be highly significant.

These unique chemical factors have led to an extensive effort to find medications or drugs effective against the cancer cell alone. Much of this search is on a plotted course, on a selected use of drugs. Some steps, however, seem almost a random investigation of innumerable compounds.

It is my belief that the concept of damaging the cancer cell alone is not too far removed. This viewpoint that the cancer cell can be damaged alone by chemicals while it does seem feasible to many of us, is not conceded even in recent German publications. It is to be noted however, that the National Cancer Institute considers it of such practical significance that it has devoted \$20,000,000 in the coming year to investigate the possibilities of Chemotherapy for cancer.

Alazopeptin, an antibiotic, is reported as effective against some cancers in mice. Several other antibiotics, Actinomycin C & D, Puro-mycin, and Azaserine are supposedly active against mice tumors. Their effectiveness against human cancers is not conclusive.

Chemotherapy has been used to a great degree in the lymphomas but the effect is suppressive and not a curative one. Following is partial list of chemical substances currently in use:

In Hodgkins disease — Nitrogen mustard, TEM, Tetpa, Phenol nitrogen Mustard and CV 1348 are used. Here the adrenal cortical hormones are helpful.

In acute leukemias — ACTH and cortisone are used to advantage.

In chronic leukemia — CV 1348 is the best treatment to date for lymphatic types. Myleran seems superior for myelogenous forms.

In lymphosarcoma — TSPA, Thio-TEPA, TEPA, TEMP, HN-2.

In polycythemia vera — TSPA-DEPA, Thio-TEPA, TEPA-TEM, p-32.

In multiple myeloma — Cortisone — urethane, I-131, p-32.

Some of these drugs, particularly nitrogen mustard, are being used at the University of Illinois College of Medicine at the time



of surgery. Nitrogen mustard is given intravenously after excision of the malignancy to destroy metastasizing cells before they can fix in distal sites.

The basis of this work has been to inject suspensions of tumor cells intravenously into rats. In addition, some of the rats were given nitrogen mustard intravenously and intraperitoneally. 97% of the rats receiving tumor cells alone developed liver metastasis; while only 19% of those given nitrogen mustard developed metastatic liver implants.

Dr. Cole and his associates have pursued this course of treatment in 45 cases of breast, stomach and colon cancer. Intravenous administration in all cases, and intraperitoneal in the abdominal cases. Nitrogen mustard is then given daily the first three postoperative days and then a four day course is repeated in three months.

Dr. G. E. Moore of Buffalo reports some remissions in breast cancer with Thio-TEPA.

Within recent years, hormones of which you are so aware, as Cortisone, ACTH, Hydrocortisone, etc., have opened a new field. For many years male and female sex hormones have played a considerable role in cancer stimulation or suppression, particularly against breast and prostatic carcinoma. The adrenal steroid hormones have now been shown to have a comparable role.

Each individual has his own pattern of function of these glands of internal secretion — abnormal function is probably associated with certain precancerous or cancerous changes. Determination of the proper balance of these hormones, the male or female sex hormones, the steroid hormones of the adrenals, or the secretions of the pituitary, are probably keys to cancer development and control. These present an area for rapid and enormous progress, possibly not only in relation to cancer, but also to all of the degenerative disorders.

A question that may be present is — Why the Cancer Society has not used Krebiozen, a drug claimed by some as the most valuable cancer treatment discovery of this century. Dr. A. C. Ivy, a former University of Illinois physiologist, has been the center of considerable medical storm in the past five years in relation to this "secret" cancer drug. It has been studied by independent critical assays, and the AMA has flatly rejected Krebiozen as

a treatment. However, Dr. Ivy and his colleagues have continued to pursue this field and have summarized their work recently in a publication "Krebiozen in the Management of Cancer." This drug is a white powder prepared from the serum of horses that have been injected with actinomyces. It was discovered by Dr. Durovic of Yugoslavia. Dr. Ivy's group reports rather marked suppressive effect, and even tumor-dissolving qualities. However, the product has not been offered for broad research. Possibly, it deserves further testing, but to date, we have very little proof as to its effectiveness. In fairness to Dr. Ivy and his group, it has been used practically, or almost exclusively in terminal, or the hopeless stage of malignancy.

Surgery, which is the oldest method of treating cancer and probably the surest, has shown improvements in technique. More satisfactory anesthesia, blood replacement, and alteration in specific surgical procedures have led to bolder, more extensive and more effective operations. Dr. Brunschwig of New York, and Dr. Bricker of St. Louis, have been two prime advocates of these super-radical procedures. Their severe critic, Dr. Moyer, has recently swung around to stating that the long term review of these extensive and frequently mutilating procedures showed that they are of value. Dr. Urban reports a 62% 5-year survival for his super-radical mastectomy; questionably a 30% increase in cure rate. One must balance the worth of a procedure of great morbidity, mortality and mutilation for many against cure for a few. The Pope, in a prayer for the men carrying out research in cancer, brought out a viewpoint that I have strongly held: We must consider the whole patient, including his position in society. In some cases, these operations impose upon the patients such heavy permanent infirmities that he is reduced to total inactivity. In that phase, is life worthwhile for the patient, and would it not be better if we allow him to continue work with a palliative procedure as long as possible? I do not know the answer.

Radiation, the second of our two established methods of treating and curing cancer, has improved markedly in its effectiveness by technical advances, both in application and through increased power. At present, multi-million volt X-rays are being assessed as to their clinical usefulness. Here, too, we are

dealing with a two-edged sword, and the hematologists feel that there is no absolutely safe dose of irradiation. For example, the increase in leukemia among patients, even in those with limited therapy or for diagnosis alone, show a straight line relationship between the amount of exposure and incidence of the development of leukemia.

With the opening of the atomic era, radioactive isotopes came into use. Their over-all effectiveness has not been as great as we had anticipated, but they are an added source of help, and are presenting a much more diverse picture than was initially realized. For example, P-32 is being used in various blood dyscrasias, polythemia vera, leukemias, certain lymphomas. Radioiodine is used to treat some appropriate cases of thyroid cancer. Palliative treatment of generalized carcinoma of the abdominal or thoracic cavities is attained with radiogold, radioactive chromic phosphate, yttrium-90 and lutecium-177, these aiding in reducing fluid accumulation. Radioiodinated human serum albumin and radioarsenic are helpful to neurosurgeons in diagnosing and localizing brain tumors. Radiostrontium applicators are useful in treating benign growths of the sclera. P-32 has been found helpful in localizing intraorbital tumors. Radiogold is used in the interstitial treatment of prostatic cancer and in some bladder cancers. This radioactive isotope has been inserted into hollow threads and used to treat cancer of the cervix, as can be done with radioactive cesium. It is likely that destruction of the pituitary gland with implantation of radioactive yttrium-90 pellets may become a substitute for the rather precise surgical removal of this endocrine structure. It is significant that the cost of these radioactive isotopes has been reduced 20-25% by the U. S. Atomic Energy Commission very recently.

To shift to other efforts than the specific etiology and treatment, we have expressed repeatedly that a prime way of increasing the cure rate is early detection. Much research effort has been beamed to find a rapid and sure way of detecting cancer in the early stage. Possibly our greatest advance in recent years has been the development of the Papanicolaou stain. This is effective. It is effective in individual cases and for surveys as shown by the Memphis study for cancer detection of the cervix in women. 70,000 women were screened,

527 were positive, 321 were unsuspected but became evident by this cytological test.

In September of this year at Rochester, New York, Dr. Holmes of the University of Colorado Medical School announced progress in the detection of cancer using "Pulse-Echo Ultrasonic Techniques." The initial patterns appear promising, but the method is not available for general use.

Under present circumstances, our greatest opportunity for cutting down the cancer death rate, is by spreading cancer education more widely — possibly putting it into the curricula of secondary schools and colleges. It should be taught that personal responsibility is the best means of early cancer detection, and at present the most substantial hope for cure. For example, surgeons have a cancer death rate of 16/10,000; men in general have a cancer death rate of 24/10,000.

Education — lay and professional — with our present tools could and should alter our cure rates enormously. For example:

25% of gynecological malignancies are cured, 80% should be.

5% of lung cancer is cured, 50% should be.

35% of breast cancer is cured, 70% should be.

35% of ENT cancer is cured, 65% should be.

85% of skin cancer is cured, 95% should be.

But — education is not all. Robins, in a review of obvious skin and subcutaneous lesions, noted that physicians delayed longer than the laity. 66% of the M.D.s went six months or more before seeking treatment, while only 45% of the public went six months or more.

Frequently, we have been accused of scaring more people than we are curing with the cancer education program. The experience of the Yorkshire Consul in Great Britain, where they held 220 lectures to the public on cancer education, and then surveyed 5,740 people as to whether the education program should be continued, is illuminating. Did it increase their worry? Should the lectures be given? Did it diminish their worry? The results of the survey showed 99.1% in favor of continuing the education program. American surveys have been in the affirmative, but not so strikingly so.

In reviewing the research program of the last few years, one must consider that the adolescence of this program is past and with entering maturity, long-term commitments for research projects must become a reality. There

is a disturbing development in the cancer research program, a movement away from the nationally coordinated program to isolated projects. This is an error. It is the result of the demands of the varied divisions of the Cancer Society and is a fault that should not be pursued by any of them. Coordinated research is a necessity.

#### SUMMARY.

1. We are becoming cognizant of specific carcinogens and factors to avoid. I hope that we can eliminate most of these better than we have eliminated the cigarette.

2. Geography has only recently been noted as a factor in the incidence of cancer.

3. The need for greater education is evident, particularly until more specific treatment is available. Even with our present knowledge the cure rate could be improved greatly.

4. Surgery and radio-therapy along with the radioactive elements are making specific advances but are not likely to produce the ultimate answer.

5. The fields of chemotherapy and immunity are just opening. They seem extremely promising.

illuminating fashion. It is divided into four sections.

Part I discusses the diagnostic aspects from a clinical viewpoint, (Dr. Penfield) and then from the electroencephalographic and radiologic positions. Because of the difficulty in evaluating the patient with seizures, this section will be of great worth to most medical practitioners.

Part II presents the latest in treatment of the convulsive state. The medical aspects of this therapy as outlined by Dr. Thomas includes a discussion of all the drugs in current use, dosages, side-effects and cost per day's treatment. This information alone is well worth the price of the volume. Emotional and psychological aspects are also developed skillfully. Drs. Penfield and Steelman then present the techniques and results to be expected by treating selected cases surgically.

Part III is concerned with the educational problems to the epileptic patient. Various facets of these problems are explained by prominent educators of the handicapped. The technique of handling these patients in their everyday lives is information all practicing physicians should acquire.

Part IV discusses employment and rehabilitation problems of the patient with seizures. Each must be properly evaluated by qualified investigators before careers can be arranged. With such an analysis it is gratifying to learn that many of our seizure patients can take a normal role in our society.

Drs. Green and Steelman are to be complimented on compiling such a valuable reference work in the field of epilepsy. Its value to the internist, pediatrician and family physician will indeed be great.

## Book REVIEWS

**EPILEPTIC SEIZURES**, edited by John R. Green, M.D. and Harry F. Steelman, M.D., The Williams & Wilkins Company, Baltimore, 1956, \$5.00.

IN NOVEMBER, 1955 many of the outstanding authorities on epilepsy met in a three-day symposium in Phoenix to consolidate their thinking on this subject. Featured in this group was Dr. Wilder Penfield, the Director of the Montreal Neurological Institute and such authorities as Dr. Robert B. Aird of the University of California, Dr. Augustus S. Rose of U.C.L.A., Dr. John L. Otto of the University of Texas, Dr. Madison Thomas of the University of Utah, as well as Phoenix's own Drs. John Green, Harry Steelman and James Riordan.

The contributions of these and other experts in the field have been edited by Dr. Green and Dr. Steelman into a comprehensive volume that presents the seizure problem in a most



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Trafton and Lind<sup>3</sup> found tetracycline (ACHROMYCIN) an effective antibiotic for treating many urinary tract infections caused by both Gram-negative and Gram-positive organisms.

English, *et al.*<sup>4</sup> noted that a daily dose of 1 to 1.5 Gm. of tetracycline resulted in urinary levels as high as 1 mg. per milliliter.

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## PHOENIX *Clinical* CLUB

The Case History in this discussion is selected from the Case Records of the Massachusetts General Hospital, and reprinted from the New England Journal of Medicine. The discussant under Differential Diagnosis is a member of the staff of the Massachusetts General Hospital. The other discussants are members of the Phoenix Clinical Club.

### MASSACHUSETTS GENERAL HOSPITAL PRESENTATION OF CASE

**F**IRST admission. A fifty-one-year-old rubber-mill worker was admitted to the hospital because of dyspnea.

The patient had been in good health until four years previously, when he noted exertional dyspnea associated with rapid heart action. The dyspnea was progressive, and in the past year walking across the factory floor caused difficulty in breathing. For the two weeks before admission the dyspnea had been severe, especially during each of the past three nights, most of which he had spent at an open window gasping for each breath. He had attempted to do some carpentry work on the day of admission, but had had to stop. His physician gave him digitalis and advised hospitalization.

The patient had never had rheumatic fever, arthritis, skin eruption, febrile illness or venereal disease. He had never been told that he had heart disease. Twenty-five years before admission he had served with the Marines in China for five years.

Physical examination revealed a well developed, tachypneic man. The neck veins were markedly distended. The chest was clear to percussion. Moist rales were heard at both bases. The border of the heart extended to the anterior axillary line. The apical impulse was visible in the sixth intercostal space, 12 cm. from the midsternal line. The rhythm was regular. The pulmonic second sound was much louder than the aortic. There was a Grade 2 aortic diastolic blow, best heard along the left sternal border and a Grade 2 harsh aortic systolic murmur. A Grade 2 diastolic rumble with a presystolic crescendo and a Grade 2 systolic blow were heard at the apex. The

mitral first sound was accentuated and had a snapping quality. The abdomen was normal. The deep tendon reflexes were normal. There was + pitting edema of the ankles.

The temperature was 99.2° F., the pulse 80, and the respirations 24. The blood pressure was 140 systolic, 50 diastolic.

The urine showed no abnormal features. Examination of the blood revealed a hemoglobin of 13.0 gm. The white-cell count was 9600, with 86% neutrophils. The sodium potassium, chloride, nonprotein nitrogen and carbon dioxide combining power were all within normal limits. A stool examination was negative to the guaiac test. A sputum culture revealed abundant alpha-hemolytic streptococci, moderate growth of *Neisseria catarrhalis* and a few colonies of *Staphylococcus albus*. An electrocardiogram showed a normal sinus rhythm, a PR interval of 0.14 second, a GRS interval of 0.07 second and tall R waves in Leads V-5 and V-6. The ST segments were sagging in leads aVL, V-5 and V-6; the T waves were low and biphasic, and the P waves were broad and notched. A tracing taken on the next day revealed no significant changes. An X-ray film of the chest showed an enlarged heart, with enlargement of the left but not of the right ventricle. The cardiothoracic ratio was 16:30. There were moderate pulmonary congestion and ill defined areas of increased density over much of the right lung. Multiple large blebs were present in the right lung, and free fluid was noted in the right pleural cavity.

The patient was given oxygen by mask, 0.8 mg. of Cedilanid intravenously, 2 cc. of Mercuhydrin intramuscularly and 600,000 units of aqueous penicillin. During the next eleven days in the hospital he improved on bed rest, a low-salt diet, penicillin, digitoxin and Mercuhydrin. An X-ray film of the chest showed less congestion, but strands of increased density were still noted throughout both lungs. He was discharged very much improved on the eleventh hospital day.

Final admission (two weeks later because of severe dyspnea). His wife stated that he had been doing fairly well until three days pre-

viously, when he felt cold in the morning, and that evening he felt flushed. The following morning he began to vomit after breakfast, and this continued for the next two days. Two days before admission he had a shaking chill followed by sweating. His family physician discontinued digitalis and potassium iodide and began treatment with erythromycin. He continued to be severely dyspneic, with retching and anorexia on the day before admission and that night slept very poorly. On the day of admission he had paroxysms of coughing and retching.

Physical examination revealed an acutely and desperately ill, dyspneic, cyanotic man who was unable to speak more than a few words because of severe dyspnea. The pupils were small, round and equal and reacted well to accommodation but not to light. The scleras were injected but not icteric. The neck veins were not distended. The lungs were clear to percussion, and an occasional distant wheeze was heard. There was a Grade 2 to-and-fro murmur at the apex that could not be delineated into systolic and diastolic murmurs. No murmurs were heard at the base. The pulmonic second sound was louder than the aortic. The abdomen was normal.

The temperature was 103° F., the pulse 120, and the respirations 40. The blood pressure was 110 systolic, 60 diastolic.

The urine gave a + test for albumin; the sediment contained many granular casts per high-power field but no white cells or red cells. Examination of the blood revealed a hemoglobin of 13 gm. per 100 cc. and a white-cell count of 16,800. The sodium was 120 milliequiv., the potassium 6.5 milliequiv., the chloride 92 milliequiv., and the carbon dioxide 17 milliequiv. per liter. The blood pH was 7.39. An X-ray film of the chest showed patchy areas of increased density throughout both lung fields, especially in both upper lobes. The emphysematous blebs were more apparent in contrast to adjacent consolidation. The heart shadow was unchanged.

The patient was immediately given oxygen under positive pressure and Digalin. He preferred lying back at a 20° angle to sitting up. Suddenly, about 10 hours after admission, he became more dyspneic and called out that he could not breathe. The lungs were full of coarse rales. The pulse was regular at a rate

of about 150. He was given 0.4 mg. of Cedilanid intravenously, tourniquets were applied, and he was placed in a sitting position. He died within a few minutes. Terminally, the neck veins, which had previously been flat, became distended.

#### Dr. Palmer Dysart:

Although no serology is noted, Argyle-Robertson pupils are described at this patient's second admission. Even though deep tendon reflexes had been recorded as normal at the first admission, it is probable that the primary aortic valvular disease was the result of syphilitic infection. And, I would deduce, even though this patient had been employed as a rubber-mill worker, he may not have been sold on the use of rubber products himself. But syphilitic aortitis is a late sequel of the disease, and exposure probably occurred twenty-five years before while he served with the Marine Corps in China. Pulmonary fibrosis and emphysema were present, and scattered patchy densities were seen on X-ray. A syphilitic pneumonitis may have been present, but another cause based upon his employment as a rubber-mill worker may be present, for many of the chemicals used in the rubber industry are pulmonary irritants.

In 1839 Charles Goodyear discovered hot vulcanization of rubber. This is a chemical combination of sulfur with rubber by which the physical properties are changed to increase its strength and elasticity and improve its resistance to changes in temperature and ageing. Crude rubber, containing natural impurities can be vulcanized with sulfur alone, while vulcanization of highly purified rubber is promoted by artificial accelerators and activators of these accelerators. Ageing of rubber is reduced by antioxidants; molding is facilitated by plasticizers; and increased wear resistance results from adding carbon black.

Charles Goodyear patented the first artificial accelerator, basic lead carbonate. The last twenty years have seen a tremendous increase in complex organic compounding ingredients, and new compounds are being rapidly added to the list. Irritation or sensitivity rarely occurs from crude dry rubber, but many of these additives are systemic toxins, irritants to the skin, respiratory tract, nervous system, gastrointestinal tract, cardiovascular-renal system and hemopoietic system, or skin sensitizers. The

effect varies with the type of substance, its concentration, mode of introduction into the system, and the duration of exposure. For inhaled toxins it has been found that in sublethal dosage, damage to the respiratory tract and the resulting inflammatory reaction is influenced more by the duration of exposure than by the concentration of the toxic agent. These conclusions are based upon extensive and detailed experimental work. Other work has shown that inhalation of sublethal doses of such toxins produces varying degrees of bronchiolitis fibrosa obliterans.

Incidentally, one of the powerful accelerators, tetraethylthiuram disulfide, because of nausea and "shakes" experienced following drinking bouts by those exposed to this compound, was named "antabuse" by Danish physicians who began using it in the treatment of chronic alcoholism.

Besides the additives used in the manufacture of rubber which may produce tissue damage, there is regular exposure of those employed in this industry to plenty of talc dust used to powder rubber products to overcome tackiness. Talc granulomata in the peritoneal cavity resulting from contamination with talc glove powder introduced during surgery is recognized, and has resulted in its elimination for this use. Pneumoconiosis from inhaled talc producing a picture similar to asbestosis has been described occurring in rubber workers. Earlier, it had been doubted that talc could do this, but definite diffuse pulmonary fibrosis with scattered small nodules, within which talc crystals occur, has been observed and recorded.

In spite of dissimilarities, it is tempting to consider that this patient might have been suffering from a condition which has been described only recently. This is functioning carcinoid, a disease complex which is similar in many respects to the conditions presented by this case, although typically, cardiac involvement in this condition is limited to pulmonary and tricuspid valve lesions, but left heart involvement is suspected to be present more frequently than has been observed.

About three years ago, a pharmacodynamic substance, 5-hydroxytryptamine was isolated from metastatic carcinoid tumors and was recognized as identical to enteramine, a substance produced by the chromaffin cells of the intestinal tract, and serotonin, a substance previously found

in the blood which had potent pharmacologic effects on the smooth muscle of the intestine, bronchi, and blood vessels. In 1954, studies in the laboratories of the National Heart Institute showed that serotonin was derived from the essential amino acid, tryptophan, and that an end product of this metabolic process was 5-hydroxyindoleacetic acid which is excreted in the urine. Patients having the clinical features of a functioning carcinoid tumor have an abnormal amount of serotonin in their circulating blood, excrete a large amount of 5-hydroxyindoleacetic acid in their urine, and present clinically varying degrees of cutaneous vasomotor phenomena of flushing and cyanosis associated frequently with frank asthmatic attacks, right heart valvular disease producing progressive exertional dyspnea and fatigability, hepatomegaly, and evidence of low grade malignancy of the intestinal tract.

If, as has been implied, repeatability is the only quality which entitles a datum to be promoted to the rank of a fact, the failure of a disease entity to produce the same pathologic complex every time must vitiate the observations that it has ever done it at all. But, the incidence of a given set of conditions in an individual cannot be predicated upon their statistical occurrence in a substantial series. Incidence by chance occurs in a material or mechanical frame of reference.

Facts within an explanatory system are fetishes whose value as embodiments of absolute truth it would be sacrilege to question. Repeatability is one of these fact-fetishes, and is rationalized, due to the complexity of things, that it is the data from which facts are made that are not repeatable, and mere data can be disregarded.

My diagnosis is that great imitator, Syphilis, and pulmonary fibrosis and emphysema.

#### DIFFERENTIAL DIAGNOSIS

Dr. Gordon S. Myers: First, I shall ask Dr. Hanelin to show the X-ray films because I think that they may help me discuss the problem intelligently.

Dr. Joseph Hanelin: The initial film indicates a great deal of change in the lung fields that is seen on all the subsequent films and is better demonstrated after the initial congestion has cleared. The heart is definitely enlarged, and I shall say more about its configuration in the later examinations. There are



large zones of density in both lungs consistent with pulmonary edema. When the congestive changes have largely cleared, about four days later, there are huge blebs visible in the lungs, particularly on the right side. There are scattered strand-like densities in both lung fields and also a fair number of small nodular lesions. These changes are consistent with chronic pulmonary disease. What the shape of the heart might indicate about individual chamber enlargement is extremely difficult or impossible to say. I suspect that in addition to hypertrophy of the left ventricle there may also be considerable enlargement of the right. This is suggested by the right anterior oblique view, in which the heart shows anterior prominence. Two weeks later, a day or so before death, there are again large blotches or density in both lungs that probably represent edema.

Dr. Myers: Do you see any calcification in the ascending aorta?

Dr. Hanelin: No, I do not.

Dr. Myers: Is there any enlargement of the left atrium?

Dr. Hanelin: There may be slight enlargement of the left atrium.

Dr. Myers: Do you see any sign of intracardiac calcification?

Dr. Hanelin: No; I cannot see any.

Dr. Myers: Do you think any of the lesions in the lung are consistent with pulmonary emboli?

Dr. Hanelin: I cannot be certain of any areas of infarction. One might wonder in the last film whether some of the densities were due to infarcts.

Dr. Myers: Could some of the strand like areas of fibrosis represent old infarcts?

Dr. Hanelin: That is possible, but the picture is not too characteristic.

Dr. Myers: After the congestion has cleared up, can you see any areas of emphysema and fibrosis?

Dr. Hanelin: There is a great deal of emphysema and many areas of fibrosis.

Dr. Myers: The initial history and physical examination are quite consistent with rheumatic heart disease, aortic and mitral disease and congestive heart failure. This patient had progressive dyspnea, beginning at about the age of forty-seven. The fact that he had no past history of rheumatic fever or rheumatic heart disease is not too disturbing because such a

history is frequently absent in patients with proved rheumatic heart disease. Initially, when he came into the hospital he had dyspnea, distention of the neck veins, rales at the lung bases, cardiac enlargement, accentuation of the pulmonic second and mitral first sounds and double murmurs at the apex and aortic areas. The blood pressure of 140 systolic, 50 diastolic, indicates an important degree of aortic regurgitation, and the electrocardiogram points decisively to hypertrophy of the left ventricle. Evidently, at the time of the first admission, he was thought to have congestive heart failure and probably some pulmonary infection since he was given penicillin. In addition he was later given potassium iodide so that the physicians who took care of him must have thought he had chronic pulmonary disease.

It must have been surprising at the time of the second admission, when he was cyanotic and extremely dyspneic, with fever and a rapid pulse, to find no definite evidence of congestive heart failure on physical examination: the neck veins were said to be normal, and there were no rales in the lungs. Nevertheless, the X-ray film of the chest taken at that time indicated a considerable degree of congestion in the lungs. It is not too uncommon to see clear evidence of marked pulmonary congestion in X-ray films and to hear very little or nothing by auscultation.

One wonders about the change of the auscultatory findings at the time of second admission. Apparently, no murmurs were heard at the base, and there was some kind of to-and-fro-murmur, which was vaguely described, that could not be delineated into a definite systolic and diastolic murmur. Perhaps this was a pleuropericardial friction rub. The observation that the murmurs were not well heard at that time could be explained by the fact that he was so desperately ill, with a very rapid heart rate. Under such circumstances, murmurs that have previously been quite obvious disappear or become very difficult to detect.

The white-cell count had risen to 16,800 which makes one think of infection or infarction. The fall in the sodium chloride could have been due to the low-salt diet, diuretics and vomiting, but the fall in the carbon dioxide and rise in the potassium make one wonder about renal impairment. If I knew the specific gravity of the urine and nonprotein nitrogen,

it might be of some help.

Dr. Benjamin Castleman: There was not enough urine on which to test the specific gravity during the final admission. The patient was in for only two days so there was enough time to determine the extraordinary electrolyte values but not the nonprotein nitrogen.

Dr. Myers: It occurred to me that he could have had emboli to the kidneys, with multiple infarcts, but there was no clear evidence of this, in view of the facts that he did not complain of pain, examination of the abdomen was negative and the urine contained no red cells. I suspect that the specific gravity was high and that this picture represented prerenal azotemia, with further electrolyte imbalance due to previous therapy and vomiting.

One must always have a high index of suspicion in discussing cases in these conferences, but I can be reasonably sure that the patient had aortic regurgitation: there was a perfectly reasonable murmur for it, the electrocardiogram indicated left-ventricle hypertrophy and the pulse pressure was wide. Was the aortic regurgitation due to rheumatic heart disease or some other defect? Were the Wassermann and Hinton tests negative?

Dr. Castleman: None were done.

Dr. Myers: So we do not have a serologic report on this patient. However, there was no previous history of syphilis, there was no calcification of the ascending aorta, and the reflexes were said to be normal. The only confusing detail is the fact that one physician noted that the pupils were fixed to light and reacted to accommodation. I do not believe that this patient had aortic regurgitation on the basis of syphilitic heart disease. Although one can have an Austin-Flint murmur in the absence of mitral disease, giving rise to a presystolic murmur at the apex, the fact that he had a very loud mitral first sound and broad, notched P waves in the electrocardiogram leads me to believe mitral disease was also present.

Dr. Castleman: Why does the electrocardiogram lead you to suggest mitral disease?

Dr. Myers: Ordinarily, patients who have aortic regurgitation and hypertrophy of the left ventricle, with or without dilation of the left atrium, are not so likely to show broad, notched P waves, usually indicating some involvement of the atrium, often by coronary-artery disease or rheumatic heart disease.

Dr. Castleman: That is due to the involvement of the atrium itself, a myocarditis?

Dr. Myers: Presumably, the atrium itself is the site of myocarditis or fibrosis. This does not exclude the possibility that the patient had only aortic regurgitation, but that seems to me considerably less likely.

The next question is, What was going on in the lung? The X-ray films showed emphysematous blebs and areas of increased fibrosis. The patient was a rubber-mill worker; Dr. Harriet L. Hardy tells me that such workers are exposed to talc and may therefore be subject to pulmonary fibrosis, which may ultimately cause cor pulmonale. Certainly, there is no definite evidence of cor pulmonale here; if there was any it must have been a very minor part of the picture.

Could there have been pulmonary emboli? I did not have the advantage of seeing the X-ray films when I first read the protocol, and I must say that I was suspicious of multiple pulmonary emboli. To be sure, pleural pain and hemoptysis were not present, but they are not invariable symptoms of pulmonary infarcts. Pulmonary emboli occur in roughly 50 per cent of patients with rheumatic heart disease and mitral stenosis who die in congestive heart failure. That makes the possibility of this complication a very real one. Nothing was said about the legs, but many patients with phlebothrombosis show nothing in the legs. Furthermore, the electrocardiogram demonstrates changes that point to pulmonary emboli in only about 10 per cent of cases. Pulmonary emboli might account for some of the X-ray findings, the clinical course of the patient with increasing congestive heart failure and the fever and leukocytosis shortly before death.

It is true, of course, that chills and abdominal symptoms, with nausea and vomiting, are quite uncommon with infarcts; therefore, bronchopneumonia may have complicated the picture. Other unlikely complications, which we do not have time to discuss in detail, I shall just mention: active rheumatic fever, subacute bacterial endocarditis complicating myocardial infarction, ball-valve thrombus in the left atrium and mesenteric or renal infarcts. None of these can I diagnose on the basis of the evidence at hand.

I shall have to conclude that this patient had rheumatic heart disease, predominantly of

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SEARLE

the aortic valve, with regurgitation and stenosis, but probably with some mitral stenosis and regurgitation as well, and that he had chronic pulmonary disease. Possibly the chronic pulmonary fibrosis was on the basis of the industrial exposure to talc. I think it likely that he had pulmonary emboli, at least at the time of the final illness, with or without bronchopneumonia.

A Physician: Was there any enlargement of the left atrium?

Dr. Hanelin: The evidence for it is slight. I do not think it is a large chamber. There is a slight posterior bulge of the esophagus at the level of the atrium that might result from some increase in its size. It is not of the size usually associated with mitral stenosis. In the presence of failure of the left ventricle there may be some increase in the size of the atrium.

Dr. Lewis Kane: It interests me that in the last admission he had a carbon dioxide of 17 milliequiv. per liter and was given oxygen, and that the terminal episode occurred shortly thereafter.

Dr. Castleman: You mean that there may have been some oxygen intoxication?

Dr. Myers: I think it is worth pointing out that patients with pulmonary disease who get into trouble with oxygen inhalation do so because of a rising carbon dioxide tension. Usually, they are in acidosis with an elevated carbon dioxide, and become more or less stuporous and then comatose and finally may die. That was not the picture here. The patient continued to be very dyspneic and finally died with a very severe episode of shortness of breath. I do not believe that was the mechanism of his death.

Dr. Kane: The carbon dioxide serves as a stimulus for respiration. When the oxygen is administered and the carbon dioxide is decreased, the stimulus would be decreased accordingly.

Dr. Myers: That apparently did not occur here. This patient was breathing very rapidly up to the time of death.

#### CLINICAL DIAGNOSES

Rheumatic heart disease, with aortic and mitral regurgitation and stenosis. Chronic pulmonary fibrosis and emphysema.

#### DR. GORDON S. MYERS' DIAGNOSES

Rheumatic heart disease, with aortic and mitral stenosis and regurgitation.

Chronic pulmonary fibrosis.

Pulmonary emboli, ?with bronchopneumonia.

#### ANATOMICAL DIAGNOSES

Syphilitic heart disease with aortitis, aneurysmal dilatation of ascending aorta and narrowing of right coronary ostium.

Pulmonary fibrosis, bilateral.

Pulmonary emphysema, bilateral.

Hydrothorax, bilateral.

Pulmonary edema.

Bronchopneumonia.

#### PATHOLOGICAL DISCUSSION

Dr. Castleman: At the time of autopsy the infiltration of the lungs proved to be pulmonary edema and bronchopneumonia. We were unable to find any infarcts. We did find pleural fluid, — 800 cc. on the left and 500 cc. on the right, — which seems surprising, for the costophrenic angles look fairly sharp on the X-ray films.

Dr. Hanelin: Do you know the interval between the date of the film and death?

Dr. J. R. Petranek: The last films were taken four hours before death.

Dr. Hanelin: I should think that this much fluid would have been shown; most of it must have developed after the film was taken.

Dr. Castleman: The underlying disease in the lung was very severe pulmonary emphysema, with huge blebs and a great deal of fibrosis. Certainly, the pulmonary reserve was very small so that the patient was likely to go into heart failure very easily. The heart was large weighing almost 500 gm.; most of the increase was of the left chamber. The right ventricle measured only 4 mm., which, with that degree of emphysema and fibrosis, does not represent very much enlargement; there was certainly not a great deal of right-sided heart failure. The valve lesion was entirely aortic and showed as classic a picture of syphilitic aortitis as we ever see. In retrospect, Dr. Hanelin, is this ascending aorta on the X-ray film a little wide?

Dr. Hanelin: Not particularly so.

Dr. Castleman: It was.

Dr. Hanelin: It does not look it.

Dr. Castleman: There was a definite dilatation of the ascending aorta, with the classic tree barking and wrinkling of the intima but without calcification. The aortic cusps were separated at the commissures up to 2 and 3 mm. in places, allowing for a free aortic regurgitation, which was proved by perfusion of the heart post mortem by Dr. Fairfield Good-



dale, Jr. Further confirmation was a small area of connective tissue in the form of a cusp on the endocardium of the ventricle below the valve — a teleologic attempt to form a fourth cusp to prevent further regurgitation! There was no disease of the mitral valve so that I think the murmur was an Austin-Flint one.

It is unfortunate that a blood Hinton or Wassermann test had not been done. Since we now see so little syphilis we often find this omission.

Dr. Myers: Was there anything abnormal in the abdomen?

Dr. Castleman: No.

Microscopical examination of the ascending aorta revealed some intimal sclerosis with a little calcification, and the medial degeneration and adventitial cellular infiltration characteristic of syphilis.

### MEETING NOTICE

**T**HE Ninth Annual Mid-Winter Radiological Conference, sponsored by the Los Angeles Radiological Society, will be held at the Biltmore Hotel, Los Angeles, California, Saturday and Sunday, February 23 and 24, 1957.

An outstanding program of pertinent interest has been arranged, and the guest speakers will be Dr. John Caffey, New York; Doctor John Frimann-Dahl of Ullevål Hospital, Oslo, Norway; Doctor Merrill C. Sosman, Boston; and Professor Brian W. Windeyer, University of London and Middlesex Hospital, London, England.

The conference fee of \$20.00 includes two luncheon meetings featuring questions and answers. A banquet (\$7.50 per plate), preceded by cocktails will be held Saturday evening. Reservations may be made through Dr. Louis J. Bonann, 1245 Glendon Avenue, Los Angeles 24, California.

Courtesy cards will be available to residents in radiology and radiologists in the Armed Forces by advance registration, with reduced tariff for the luncheons and banquet. Hotel reservations should be made promptly through the Convention Manager, Biltmore Hotel, Los Angeles, Calif.

### CARE OF MILITARY PERSONNEL AWOL

**T**O THE Editor: In a number of cases physicians and hospitals have accepted for emergency treatment members of the Army who were in a status of absent without official leave (AWOL). Upon subsequent submission of vouchers for payment, the physician or hospital has had to be informed that current regulations preclude the payment from public funds for medical treatment rendered military personnel in such a status.

Upon the acceptance by a hospital or physician of a member of the military service (Army, Navy or Air Force), immediate report should be made to the nearest military facility of the illness or injury. This procedure should be accomplished whether the person is absent with or without official leave in order that his parent organization may be informed of his continued absence by reason of illness or injury. If he is in an AWOL status, the report of his location and illness or injury constitutes a return to military control and, in effect, terminates his AWOL status. The Government subsequently becomes responsible for payment of his medical care by civilian agencies. These statements apply to practically every situation except unusual cases in which a person is engaged in a criminal act or when unauthorized medical care is furnished for a condition that is not an emergency. Also, the assumption must be made that one service will act for the other in the matter of relaying the information to the parent organization.

Statements of account for payment may be forwarded to the commanding officer, who will transmit them to their proper designation. The processing of an account involves a matter of weeks, but payment is certain when emergency medical care is rendered a bona fide member of the military service who is not AWOL and who is not engaged in a criminal act. . . ."

It cannot be overly stressed that early reporting of the individual to the proper military authorities is of the utmost importance.

Any inquiries concerning the subject discussed may be referred to my office, addressed directly to the Surgeon, Headquarters Six Army, Presidio of San Francisco, California.

Sincerely,

HENRY W. DAINE  
Colonel, MC  
Army Surgeon

## THE *President's* PAGE

### TO MY COLLEAGUES:

On Sunday, November 19, 1956, at Tucson, Arizona, a contract was signed by your officers to make operative in Arizona the Medicare Program, authorized by Public Law 569 of the 84th Congress of the United States. The Program went into effect at 12:01 A.M., December 7, 1956.

You will soon receive copies of the fee schedule, which will explain the benefits provided to eligible dependents, and the charges for each procedure. Please note carefully that provision is not made for usual office procedures for out-patient care, other than repair of lacerations or treatment of fractures not requiring hospital confinement. Specifically excluded from the Medicare Program are: (1) Chronic diseases and domiciliary cases; (2) Nervous and mental disorders except for diagnostic purposes; (3) "Elective" procedures; (4) Treatment normally considered to be out-patient care; (5) Prosthetic devices, hearing aids, orthopaedic footwear, etc.; (6) Non-emergency ambulance service; (7) Routine home calls. The Council of the Arizona Medical Association feels that the fee schedule is fair and reasonable and represents the average charges for these services in this State. Your Medicare and Medical Economics Committees with the cooperation of Arizona Blue Shield spent many hours in formulating and preparing this schedule of charges, — and our thanks go to the members of these groups.

On November 12, 1956, representatives of your Association flew to Washington, D. C. They were: Doctor Frank W. Edel, Chairman, and Doctor Paul B. Jarrett, Member of the Medicare Committee; Edward Jacobson, Attorney; Robert Carpenter, Executive Secretary of the Arizona Medical Association, Inc.; L. Donald Lau, Executive Director of Arizona Blue Shield; and your President. November 13th was spent in conference with C. Joseph Stetler, Director of the Department of Law of the American Medical Association. On November 14th your representatives met with the Department of the Army negotiating team representing the Department of Defense and discussed the fee schedule and terms of the contract. Matters of basic principles and ethics in safeguarding good medical practice were carefully and studiously discussed.

Article II of the contract provides that: "A physician shall have the right to decline to participate under this program or to refuse any individual case without stating a reason therefor, and dependents shall have the privilege of choosing any physician who agrees to provide medical services in accordance with the schedule of allowance (Fee Schedule)." The contract is binding until June 30, 1957, and is then open to renegotiation.

The Arizona Blue Shield Medical Service is designated to serve as the fiscal agent. You will soon receive the claim forms for presentation to the Arizona Blue Shield for payment for services rendered.

The Council has designated the members (of the Association) now serving on the Professional Committee of Arizona Blue Shield, with the addition of Doctor Frank W. Edel, to represent this Association as a board of arbitrators to mediate any disputes or misunderstandings that may arise in the administration of this Medicare Plan.

In conclusion there are two items which should be clarified, i.e.:

(1) The Medicare Program is a plan of the Federal Government to be administered by the Department of Defense through the Department of the Army under Public Law 569 and should be in no way associated with our current Arizona Blue Shield Plan.

(2) This Medicare Plan presently provides ONLY for the eligible, lawful spouse and dependent children of personnel of the uniformed services.

Under this plan we are working with — not for — the Department of Defense in providing good medical care to the dependents of the men in uniform who serve us.

I take this opportunity to express my sincere gratitude to Doctor Frank W. Edel, Doctor Paul B. Jarrett, Mr. Edward Jacobson, Mr. Robert Carpenter, Mr. L. Donald Lau, and to all of the others who helped in these negotiations for their wise counsel and their unselfish contribution of their time and energy.

Cordially,  
THE ARIZONA MEDICAL ASSOCIATION, INC.  
A. I. Podolsky, M.D.  
President

# Editorial

## ARIZONA MEDICINE

Journal of

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The Editor sincerely solicits contributions of scientific articles for publication in ARIZONA MEDICINE. All such contributions are greatly appreciated. All will be given equal consideration.

Certain general rules must be followed, however, and the Editor therefore respectfully submits the following suggestions to authors and contributors:

1. Follow the general rules of good English, especially with regard to construction, diction, spelling, and punctuation.  
2. Be guided by the general rules of medical writing as followed by the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.

3. Be brief, even while being thorough and complete. Avoid unnecessary words. Try to limit the article to 1500 words.

4. Read and re-read the manuscript several times to correct it, especially for spelling and punctuation.

5. Manuscripts should be typewritten, double spaced, and the original and a carbon copy submitted.

6. Articles for publication should have been read before a controversial body, e.g., a hospital staff meeting, or a county medical society meeting.

7. Exclusive Publication—Articles are accepted for publication on condition that they are contributed solely to this Journal. Ordinarily contributors will be notified within 60 days if a manuscript is accepted for publication. Every effort will be made to return unused manuscripts.

8. Illustrations—Ordinarily publication of 2 or 3 illustrations accompanying an article will be paid for by Arizona Medicine. Any number beyond this will have to be paid for by the author.

9. Reprints—Reprints must be paid for by the author at established standard rates.

The Editor is always ready, willing, and happy to help in any way possible.

## PHENOTHIAZINE

OLD DRUGS like old soliders never die, they just come back with new names. Some years ago there was a drug called Thiodiphenylamine. It was used in humans as a urinary antibacterial and anthelmintic, but it was abandoned because of its toxicity. So for a few decades it fell into obscurity. Then it was revived some years back by veterinary physicians under the name of Phenothiazine. In animals it was and is used as an anthelmintic in doses of  $\frac{1}{4}$  to  $\frac{1}{2}$  grain per pound of animal weight, or about 200 to 300 grains to a half ton animal. Now if you turn to your pharmacology books, you can find no mention of these agents. In the latest G. & G. nothing. In Drill's huge volume there is one sentence. On page 60/4 Drill states phenothiazine is used as a veterinary vermifuge, its use in man, however is unsatisfactory. This is from books little more than a year old. A glance at page 197 of the latest Epitome of U. S. P. and N. F. shows Phenothiazine listed with its old name also. Here is what is stated. "Apparently admitted to the N. F. for its use in veterinary medicine . . . but has been abandoned because of toxicity." So what does all this mean? Bear with me and we shall soon find out.

A few years ago there came out of France and Switzerland a "new drug" that made front pages in the artificial hibernation flourish. About the same time, there came a new antihistaminic and anthelmintic. This "new drug" was called by various names and finally emerged as Promethazine. Sounds familiar, doesn't it? Then came "an improvement" in the form of chlorpromazine. Now you know what it is. Well a still further "improvement" was the recent release of promazine. You want the trade names? Why it's Phenergan, Thorazine, and Sparine. But what are they? Pick up a sample and look at the small print under the name promethazine, chlorpromazine, and promazine. They are none other than new names for our old friend phenothiazine, a three ring compound with a nitrogen and a sulfur atom in the middle ring. Only the side chains differ very slightly, or not at all as in the case of Thorazine which has the



halogen in the third ring. So we came back to the old thiodiphenylamine or phenothiazine. Wyeth is honest enough to admit Sparine and Phenergan are phenothiazines. Others, and there are more than one other now, in the field have tried to obscure the origin of these compounds by using only the promazine nomenclature.

New phenothiazine compounds have been formed. Actually several hundred of these "new" compounds are being screened for the happy pill. When it was for worms, phenothiazine was "for the birds." Now that mood affecting is the vogue, we can anticipate being bombarded with numerous glowing reports. However, we must exercise a bit of caution. What was once abandoned as too toxic is not going to lose an iota of its harmfulness just because it has a new name.

Robert J. Antos,  
Guest Editor

### FEE SPLITTING

**T**HE COMPLAINT registered by many of the physicians of the State of Arizona at the last Delegates Meeting in Chandler against the method of Blue Shield's payment of assistant surgeon's fees as "out and out fee splitting" was substantiated by Dr. Paul R. Hawley of the American College of Surgeons at the recent San Francisco meeting. However, in contrast to his complaint, Arizona Blue Shield is to be commended in promptly attempting to correct this error, once it was brought to the attention of the administrative unit.

However, is the contemplated correction satisfactory and adequate? Is "fee splitting" avoided? Is the interest of the patient adequately protected? Or, are referrals encouraged to the man who will agree to use the referring physician even if house staff assistance is available? The present decision would not seem to discourage fee splitting. It seems to be a compromise, an effort to satisfy the surgeon who objects to a cut being made into his fee, and not a step to block "fee splitting."

"Fee splitting" has not proved to be a problem in this section of the country to date. However, known approaches have been made within

recent months. It would seem advisable to encourage the Arizona Chapter of the American Academy of General Practice and the Arizona Chapter of the American College of Surgeons to take steps that no roots are planted that would permit "fee splitting" in any form.

### New York Medical Society Votes Two To One Against Mandatory A. M. A. Membership

In a recent state-wide referendum poll by the medical society of the State of New York, its members voted two to one against making membership in the A. M. A. mandatory along with membership in county and state society.

In commenting on the above it is my personal opinion that the advantages of being a member of the American Medical Association are many. No one can deny the many benefits to medical education, the level of medical practice, etc. that has resulted from the American Medical Association. One who is unwilling to support the American Medical Association with his membership is parasitic in that the benefits are desired, recognized, but not wished to be supported financially. Much of the resistance to mandatory membership might be ascribed to the political expression of the American Medical Association. It is obvious in America today that organized medicine must have its voice. It is equally apparent that the opinion expressed cannot be tailored to each person's individual desire.

E.E.Y.

### LETTERS TO THE EDITOR AGAINST COMPULSION

**R**ECENTLY, in a state-wide referendum, members of the Medical Society of the State of New York voted two to one against making AMA membership mandatory along with membership in the state and county societies.

Congratulations, New York!

Few things can be worse than compulsion. Certainly the strong tendency toward compulsion and bureaucracy which we have all ob-



served in the medical profession in recent years is to be resisted at every turn. The argument that increased AMA membership of state members will accordingly increase the number of delegates to which the state is entitled, is indeed weak. Principle certainly must stand above expediency.

Most doctors are happy to support the AMA in most of its activities — but not all.

Most doctors are happy to support the State Medical Society in most of its activities — but not all.

Most doctors are happy to support the County Medical Society in most of its activities — but not all.

Most doctors are happy to belong to the AMA, the State Society, and the County Society.

But doctors of medicine are graduates of a school of higher education, are qualified to practice their profession, and are licensed by the State to conduct such a practice. They are certainly qualified to determine for themselves to which organizations they wish to belong.

Are you listening, Arizona?

Louis G. Jekel, M.D.

## 1957 ANNUAL MEETING

**I**NTRODUCING Raymond R. Lanier, M.D., Professor of Radiology, University of Colorado School of Medicine.

Doctor Lanier was born in Louisville, Kentucky on July 24, 1914. In June, 1935 he received his Bachelor of Arts degree from the University of Richmond, Virginia, took post-graduate work in Zoology at Duke University, in anatomy and physical anthropology at Washington University, receiving his Doctor of Philosophy degree in June, 1939. He received his doctor of medicine degree from Washington University School of Medicine in September, 1944. Doctor Lanier's internship and residency were served at the University of Chicago Clinics from 1944 to 1948, covering medicine, surgery, and radiology. He was certified by the American Board of Radiology in June, 1949.

Doctor Lanier served as an instructor in gross anatomy at Washington University School of Medicine from 1937 to 1942; as an instructor in roentgenology at the University of Chicago Clinics from March 1948 to December 1948; and as Assistant Professor of Roentgenology at the University of Chicago Clinics from January



Raymond R. Lanier, M.D.

1949 to June 1950. He received his appointment as Professor of Radiology at the University of Colorado School of Medicine in July 1950. He is a member of many medical societies and honor societies.

## ANNUAL HANDICAP GOLF TOURNAMENT

**D**OCTOR Paul J. Slosser of Yuma has been appointed chairman of the Annual Handicap Golf Tournament Committee, who, with his assistants, Doctor G. Calvin Williamson and Doctor Robert A. Stratton, will arrange for the Tournament scheduled to be held Saturday, April 13, 1957. The membership will be informed of the details at a later date.

## MEDICAL HISTORY OF ARIZONA

**M**UCH OF THE record of the past is lost because the man who knows the story thinks someone else could "write it better". Please send in your tale for Arizona's History of Medicine.

HOWELL RANDOLPH, M.D.  
Historian

## *The History of Medicine in Arizona*

**JOHN CHARLES HANDY, M.D.**

(Tucson, 1871-1891)

By W. V. Whitmore

**O**F THE five men already mentioned Dr. Handy was the pioneer. He was born in Newark, New Jersey, October 20, 1844. When he was only 9 years of age, his family moved to California. He was graduated from Cooper Medical College, San Francisco, in 1863, at the age of 19 years. He was very soon appointed Surgeon in the United States Army, being stationed first at Angel Island, California, and later at two other points in that state. He came to Arizona in 1866. Early residents of Tucson speak of meeting him at San Antonio, Texas, and state that he went from there to some Army Post in New Mexico. Certain it is that he was at Forts Apache, Thomas and Grant, Arizona, from 1869 to 1871. He resigned from Fort Apache in October 1871. He was thus one of the early pioneer physicians of Arizona — as well as the first medical man to remain in Tucson long enough to leave a lasting imprint upon the community.

### REASON FOR LOCATING IN TUCSON

About 35 years ago Mr. Samuel Hughes — "the father of Tucson" related to me the circumstances under which Dr. Handy became a resident of Tucson. Mr. Hughes came here in 1858 — at death's door with hemorrhages from the lungs. But McClintock's History of Arizona (1916) lists him at that date as the "oldest, living, white pioneer in Arizona". After resigning from Fort Grant Dr. Handy came to Tucson primarily to place three orphan Indian girls in suitable families here. While he was here Mr. Hughes became ill and Dr. Handy was summoned. Upon learning that the Doctor's plans for the future were quite indefinite, Mr. Hughes asked him how much of a guarantee would be required to persuade him to remain in Tucson. Dr. Handy replied that if he had an annual income of \$2,500 assured, he would be willing to take his chances here. Mr. Hughes did not wait to get well but, donning his clothes, went out upon the street. In a short time he returned with a list of more than 25 names of heads of families, who agreed to pay Dr. Handy \$100 a year for medical services.



Dr. John Charles Handy

### PROFESSIONAL ABILITY

Dr. Handy proved to be a distinctly high-class man, both as a physician and surgeon. His natural ability — shown by his graduating when only 19 years old — and his wide professional experience had given eminent skill and excellent judgment. He seems to have been both scientific and practical — unusually well fitted to meet the primitive conditions of that date, and he at once won the high respect and utmost confidence of the people here.

**County Physician** — During most of his 20 years here he held the position of County Physician. Never have the poor of Pima County had more attentive and skillful service than during those years.

**City Physician and Health Officer** — The first City Directory of Tucson (1881) lists Dr. Handy in the dual role of City Physician and Health Officer. Epidemics — especially of smallpox — were much more frequent in those primitive days. In epidemics or threatened epidemics all eyes were turned to Dr. Handy and such was their confidence in him that sighs of relief were heard on all sides when it was known that he was in charge.

**Division Surgeon of Southern Pacific** — From the coming of the Railroad (1880) Dr. Handy

was Division Surgeon and he made a reputation for himself by the remarkable results obtained in this important field. Officers and employees alike placed in him the utmost confidence and held him in the highest esteem.

#### NON-PROFESSIONAL ACTIVITIES

County Supervisor, President, Arizona Pioneers, Charter Member of Masons, Knights of Pythias, Legion of Honor. First Chancellor of the U. of A. (1886).

**Unusual Service** — Primitive conditions practically required this. At that time trained nurses here were unknown. So certain phases of work had to be done by the physician — if they were done at all. In some families there was no one who could be trusted to do properly the necessary culinary work. In such cases, early residents relate, Dr. Handy actually and literally, with his own hands, prepared suitable nourishment — not only once but until the patient recovered.

#### DR. HANDY SHOT

A few minutes after noon, September 24, 1891, at the southwest corner of Church and Pennington streets Dr. Handy was shot. He was helped to his office scarcely a block away. There he found his office partner, Dr. Spencer. Drs. Fenner and Green soon arrived, then to render all assistance possible. Dr. Handy was emphatic on one thing, viz., that he would have no one touch him but Dr. Goodfellow. In accordance with his wishes Dr. Goodfellow was summoned from Tombstone. Dr. Handy was taken in a herdie to his home on North Main St., where one or more of the doctors remained with him.

#### DR. GOODFELLOW'S RECORD TRIP

Our veteran telegrapher — Mr. H. W. Howard — Southern Pacific Dispatcher that day, relates wiring for Goodfellow and arranging a conveyance for him. A Tombstone livery team, at full speed around those mountain curves took him to Fairbanks. There a wheezy locomotive awaited him. Goodfellow himself drove the engine with throttle wide open over the trestles and around the sharp curves of that narrow gauge track to Benson.

Mr. A. S. Reynolds — our enthusiastic pioneer — was a Southern Pacific brakeman on a work train waiting for orders at Willcox. The message flashed over the wire that Dr. Handy had been shot. Agent and crew were lamenting this unfortunate circumstance, when the agent was

called to the key and, a few minutes later, brought out instructions for the crew to take engine and caboose to Benson, pick up Goodfellow and take him to Tucson. Soon after they reached Benson, Goodfellow arrived and transferred to the Southern Pacific engine. Reynolds and the conductor were in the cupola of the caboose and saw Goodfellow running the engine. He took those curves west of Benson — noted in early railroading — at such a rate of speed that at one time the conductor jumped up and set the brakes of the caboose, fearing a derailment. When they reached the station of Tucson, they were instructed to proceed to the Main St. crossing less than two blocks from Dr. Handy's house.

#### OPERATION

Dr. Goodfellow arrived about 8 p.m. A consultation was held with Drs. Spencer, Fenner and Green. The bullet had entered the left side of the abdomen about two inches below the lower rib, emerging at the very extremity of the spine. Undoubtedly it had perforated the intestines. There was hardly a ray of hope of recovery without attempting a repair of the injury. How much hope there would then be would depend upon the extent of the injury and upon their ability to repair such damages. This was laid before Dr. Handy and he requested that the attempt be made. So at 10:20 the operation was begun. It proved to be a tedious affair, for they found 18 or 20 perforations in four or five feet of the intestines. Just as the last stitches of the operation were being taken, Dr. Handy expired — at 1 a.m., September 25, 1891. This was Friday morning.

The body was embalmed and that evening lay in state at the Masonic Lodge rooms — on the upper floor of what is now the Ormdorff Hotel. People flocked there night and day. Mexican women by scores remained there on knees in prayer. Guards tried to keep the number within reason, but so great was the crowd that fears were entertained for the safety of the building.

**NOTE:** Dr. Handy married Mary Page, daughter of Dr. Forbes' mother-in-law, when she was about 14 years old. There were four children. At one time old timers say that Dr. Handy was running two households and his favorite diversion was getting the other woman and her child in his buggy and driving past his own house.

It was his wife's threat to get a divorce that lead to the shooting. Handy threatened to kill any lawyer that took her case. The only one who dared was Frank Heney. Handy was a very high tempered, hard drinking man. John Etchells remembers going to his office with his father and being given a prescription which Etchells, Sr. tore up, after leaving the office, saying "they would return when Dr. Handy is in better condition".

Heney had just left the court house, when Handy went after him. In the fight Heney's pistol was discharged and Handy shot. Heney was acquitted.

### PUBLIC ATTITUDE TO THE M.D.

**M**OST PEOPLE like their doctors and are generally satisfied with medical service. But the public offers some definite suggestions for ways doctors might improve the doctor-patient relationship.

These suggestions came to light when results of a nationwide survey done by a market research firm for the American Medical Association were tabulated. Heading the list of suggestions for doctors was "be available, come when called." This desire that a doctor be available when needed is not news to the medical profession, whose members have been working for the last five or six years to blanket the country with 'round-the-clock emergency call systems and similar informal arrangements to guarantee that availability.

Second suggestion from the public is "charge lower fees." Doctors have long suspected that most of the profession's public relations problems arise from the economic side of medicine. Yet in the survey individual doctors' charges received only moderate criticism by the public. The public is by no means as critical of doctor bills as it is of other costs of medical care, such as hospital and drug bills. Almost five times as many people (41%) say hospital bills have risen the fastest since World War II as say doctors' bills have (9%). Almost four times as many (32%) mention drug bills as having increased with the greatest speed.

People want doctors to take more personal interest in them and be more friendly and sociable, the survey showed. Assembly-line medicine, where patients are rushed through in

an impersonal manner is not what the average American is seeking in his own physician.

Closer adherence to appointment schedules is also suggested by the public who express annoyance at unreasonable waits to see their doctors. People also want doctors to be honest and frank with them in regard to illnesses and fees. They also think doctors ought to assume more responsibility for informing the public about medicine as a part of their efforts to get along better with the public.

### SOUTHWESTERN MEDICAL ASSOCIATION

**T**HE SOUTHWESTERN Medical Association held its annual meeting in Albuquerque October 17, 18, and 19, 1956, under the presidency of John H. Dettweiler, M.D. of the host city.

Guest speakers were:

Robert H. Barter, M.D., Associate Professor of Obstetrics and Gynecology, George Washington School of Medicine.

W. B. Bean, M.D., Professor of Medicine and Head of the Department of Medicine, University of Iowa School of Medicine.

John A. Migler, M.D., Professor of Pediatrics and Head of the Department of Pediatrics, University of Iowa School of Medicine.

Stephen Rothman, M.D., Professor of Dermatology and Head of the Department of Dermatology, University of Chicago School of Medicine.

Colin G. Thomas, M.D., Associate Professor of Surgery, University of North Carolina School of Medicine.

Galen M. Tice, M.D., Professor of Radiology and Head of the Department of Radiology, University of Kansas School of Medicine.

Every autumn, the Southwestern Medical Association holds a meeting at which a group of outstanding medical men from various parts of the country appear as guest speakers. The program is designed to be of general interest. Physicians from Arizona, New Mexico, West Texas, Chihuahua, and Sonora attend. The scientific program is always worthwhile, and the social events for men and women both are invariably excellent.

The 1957 meeting will be held in El Paso and the 1958 session in Arizona — either Tucson or Phoenix.



in bronchial asthma

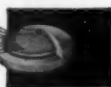
clinical evidence<sup>1,2,3</sup> indicates that to augment the therapeutic advantages of the "predni-steroids" antacids should be routinely co-administered to minimize gastric distress

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**References:** 1. Boland, E. W., *J.A.M.A.* 160:513, (February 25,) 1956. 2. Margolis, H. M. et al, *J.A.M.A.* 158:454, (June 11,) 1955. 3. Bollet, A. J. et al, *J.A.M.A.* 158:459, (June 11,) 1955.

2.5 mg. or 5 mg. prednisone or prednisolone with 50 mg. magnesium trisilicate and 300 mg. aluminum hydroxide gel.

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## TOPICS OF *Current Medical* INTEREST

### INSECTICIDE POISONING

By Paul B. Jarrett, M.D.

**S**EVERAL recent deaths in Arizona and numerous cases of organic insecticide poisoning with recovery, point to the need for information on the part of Arizona physicians which might be life-saving in a serious case of organic phosphate poisoning.

The same qualities that make the organic phosphate insecticide such as Parathion, Tetraethyl pyrophosphate (TEPP) and others such excellent bug killers, make them also excellent killers of warm blooded animals. These compounds were first formulated by the Germans in research for a toxic war chemical and are related to the "nerve gasses" that are justifiably dreaded by civil defense and military officials alike. They all have in common a derivation from phosphoric acid and act by interference with the enzyme choline-esterase of the blood and tissues. Obviously with a preponderance of acetyl-choline and no means of destruction of this chemical compound, the organism will have the effect and symptoms of para-sympathetic stimulation, the same as in mushroom poisoning or Calabar bean (physostigmine) poisoning. (This latter used to occur frequently in Africa through the jolly efforts of certain natives to establish guilt in a suspect — if he survived the "ordeal bean" concoction he was innocent. Practically everyone was guilty as sin.) It isn't necessary here to recount the symptoms of a very potent parasymphatheticomimetic.

Important to remember is that the antidote is Atropine. In an individual with history of contact with the organic phosphates, (and it can be absorbed by any route) with symptoms of parasymphathetic stimulation, a fiftieth of a grain of atropine intravenously, repeated every fifteen minutes until signs of atropinization occur may be life-saving.

Before the start of the next dusting and spraying season, we hope to have a full-length article on these poisons, but more cases are seen at the close of the season for two reasons, the organic phosphates are cumulative, and the applicator who has gone through the summer without poisoning himself concludes the stuff isn't so bad after all.

### P. L. 569 MEDICARE

With the signing of Public Law 569, dependents of military personnel are assured broad medical care as a statutory right, and the Defense Department achieved a major goal in its program to make a military career more attractive. This program is in no way concerned with the Veterans Administration. The statute recites:

"The purpose of this Act is to create and maintain high morale throughout the uniformed services by providing an improved and uniform program of medical care for members of the UNIFORMED services and their dependents."

Eligibility for dependent medical care includes:

- (a) The lawful wife of the service member, or lawful husband.
- (b) Children, under 21, unmarried, including adopted or step children.
- (c) Parents and parents-in-law, if in fact dependent for over half of their support.
- (d) Widows and the dependent children of deceased members whose death occurred on active duty or in a retired status.

The scope of the care includes:

- (a) Diagnoses
- (b) Care for acute medical and surgical conditions
- (c) Care for contagious diseases
- (d) Immunizations
- (e) Maternity and infant care
- (f) Certain limited dental care

The services facilities will NOT provide:

- (a) Care for chronic disease and domiciliary cases
- (b) Care for nervous and mental disorders
- (c) Elective medical and surgical treatments
- (d) Prosthetic devices, hearing aids, orthopedic footwear, etc.
- (e) Non-emergency ambulance service
- (f) Routine home calls

In the case of wives and children of active duty personnel, hospitalization may be provided at civilian facilities with the only charge being \$25.00 or \$1.75 per day, whichever is higher, for each period of hospitalization.

This Association will be required to determine (a) whether or not it shall participate in this program, (b) what agency shall be selected to handle the administrative work in Arizona and act as the "fiscal agent" under the law, and (c) develop a policy in regard to any fee schedule or fee schedules under which physicians will work in this State. Council is currently considering this problem.

## EARLY MEDICAL MANAGEMENT OF MASS CASUALTIES IN NUCLEAR WARFARE

**N**UCLEAR weapons are capable of producing large numbers of injured almost instantaneously. Under conditions of nuclear warfare, it is apparent that at least during the early post-detonation period, a wide disparity will exist between the medical load imposed and the surviving local medical means available. The number of casualties in need of care will far exceed the normal patient capacity of medical installations in a disaster area. In meeting the problem, the extent of medical care given will be determined by two considerations: i.e., the providing of maximum care for the maximum number of patients and the avoidance, wherever possible, of procedures which will reduce any patient's ability to care for himself. The medical effort will be limited by the large number of injured to be treated at one time, the availability of evacuation resources, and the capabilities of the supporting medical units.

### General Principles.

Realization of Sound Professional Sorting by —

(1) Prompt return to duty of patients with minor injuries, who are or easily can be rendered effective.

(2) Establishment of a system of treatment priorities for the injured, such that —

(a) Early priority is given to those injured who are most likely to respond to the treatment available at the time and place.

(b) Only the most expedient therapeutic procedures sufficient to meet immediate medical requirements will be performed.

(c) Excepting urgent life-saving procedures, nothing will be done which decreases the patient's ability to care for himself.

### Economical Utilization of Medical Assets by —

(1) Maximum conservation of medical effort, in that trained medical individuals are not assigned to first aid, rescue, transportation, or non-technical labor functions.

(2) Rigorous conservation of essential supplies.

Planning and Training for Medical Management of Mass Casualties in Nuclear Warfare, in Which:

(1) Preparation is based on knowledge of

nuclear weapons effects and sound medical practices.

(2) Training is practical rather than theoretical.

**Nuclear Weapons Effects and Injuries Produced.** a. Nuclear weapons produce blast, thermal, and ionizing radiation effects. Resulting injuries are produced by one or a combination of the three effects. Multiple injuries will be common. The incidence and severity of injury will be dependent upon several factors, including: type and size of weapon, distribution of target population, physical composition of structures in the target area, meteorological conditions, and the warning time interval.

b. Injuries produced by positive and negative pressures within the blast wave resulting from a nuclear detonation are not of medical significance. However, many missile injuries may occur as a result of flying debris of relatively low velocity (1,000 feet/second or less) or from personnel being cast about by the blast wave. Contusions, abrasions, lacerations, crush injuries and penetrating wounds will be prevalent. Amputations, avulsions, and perforating wounds will not be uncommon, but less frequent. Personnel within or adjacent to buildings may receive a higher percentage of head trauma. Except for these, distribution of injuries may be expected to occur in proportion to the body area. The anatomical distribution of wounds will approximate the following:

- |                               |            |
|-------------------------------|------------|
| (1) Head, face and neck ..... | 12 percent |
| (2) Thorax .....              | 15 percent |
| (3) Abdomen .....             | 15 percent |
| (4) Upper extremities .....   | 37 percent |
| (5) Lower extremities .....   | 37 percent |

c. Thermal injuries result from the flash incident to detonation of the weapon or are produced by ignition of clothing, by burning buildings and other combustible materials. Flash, or profile burns, involve only those portions of the body in direct line of sight with the detonation. They are more frequent on the exposed skin surface, but, with sufficient thermal energy, may be sustained through clothing. Flash burns incurred under clothing will be less severe than flash burns occurring simultaneously on exposed skin. Flame burns may cover great areas of the body surface, are usually severe, and result in great morbidity.

d. Radiation injuries may result from either prompt or residual radiation effects. Prompt

radiation is of very short duration and occurs in a limited area relatively close to the point of detonation. Of those exposed to high dosages of prompt radiation, few will survive injuries produced by other effects. Residual radiation effects cause injuries to individuals exposed in areas contaminated by radioactive fission products or in areas where type of weapon burst has caused induced radiation. This is of little immediate medical significance because appearance of symptoms is delayed.

**First Aid and Rescue.** a. The size of the medical load and the limited medical means available make it essential that medical service personnel be used only in medical treatment facilities. The principle of economical utilization of all medical assets precludes the use of trained medical personnel for first aid or rescue operations.

b. It is recognized that the saving of many lives and limbs of the injured will depend upon proper and prompt application of first aid and effective rescue procedures. First aid will consist of self-aid, "buddy aid", or aid rendered by rescue teams. Training programs in first aid are indicated for all personnel, and should include:

- (1) Application of dressings.
- (2) Control of hemorrhage.
- (3) Emergency splinting of fractures.
- (4) Handling of the injured.
- (5) Artificial respiration and maintenance of upper airways.
- (6) Emergency care of certain wounds (Examples: hand injuries, jaw injuries, and sucking chest wounds).

**Medical Sorting.** (a) Sorting or triage is defined as the process of sorting sick and wounded on the basis of the urgency and type of condition presented, so that they can be properly routed to medical installations appropriately situated and equipped for their care. Sorting is the key to the effective management of large numbers of casualties. It is the immediate grouping of patients according to type and seriousness of injury, likelihood of survival, and the establishing of priority for treatment to assure medical care of greatest benefit to the largest number. Sorting effects early release from patient status of maximal numbers of personnel who are capable of continuing their primary duty, caring for themselves and others, or can participate in rescue activities. Medical sorting

permits an orderly, timely, and efficient utilization of available medical means. It is a continuing procedure carried out at each echelon of care as patients are evacuated rearward. The critical importance of sorting demands that physicians assigned this responsibility be selected on the basis of mature professional judgment.

b. The objectives of medical sorting are accomplished by designating patients within categories. Criteria for grouping will vary with the situation, the backlog of patients awaiting medical care, and the capability of each receiving medical unit. Categories for medical care should be as follows: first, Minimal Treatment, patients who can be returned to duty immediately; second, Immediate Treatment, patients for whom expedient procedures will save life or limb; third, Delayed Treatment, patients who, after emergency care, incur little increased risk by delay in further treatment; and fourth, Expectant Treatment, patients so critically injured that only complicated and prolonged treatment offers any hope for improving life expectancy. Examples of these four groups of patients are as follows:

(1) Minimal treatment. In this group are effective individuals who can be returned to duty with minor injuries such as small lacerations and contusions, simple fractures of small bones particularly of an upper extremity, and second-degree burns of less than 10 percent of the body surface, not including incapacitating burns of the hands or face. Also included in this group are non-effective individuals who require holding facility care for their daily needs, such as: persons with second-degree burns of the face interfering with sight and/or eating, incapacitating burns of both hands, disabling fractures of minor bones, or moderate neuropsychiatric disorders.

(2) Immediate treatment. Patients with hemorrhage from an easily accessible site, extensive lacerations, rapidly correctable mechanical respiratory defects, severe crushing injuries of the extremities, open fractures of major bones, and incomplete amputations.

(3) Delayed treatment. Patients with moderate lacerations without extensive hemorrhage, closed fractures of major bones, and non-critical injuries of the central nervous system.

(4) Expectant treatment. Patients with critical injuries to the respiratory or central nervous



systems, significant penetrating abdominal wounds, multiple severe injuries, and severe burns of large areas of the body surface (40 percent and above).

c. The proportional distribution of patients among the above four categories may vary considerably, but for planning purposes will be as follows:

Minimal Treatment .....	40 percent
Immediate Treatment .....	20 percent
Delayed Treatment .....	20 percent
Expectant Treatment .....	20 percent

**Treatment.** a. The extent of treatment given by medical personnel to casualties during the first few days after the employment of nuclear weapons will depend upon the medical capability, the number and types of injured, and the situation. The prime objectives of treatment are to restore a casualty to a useful state, increase his self-sustaining status, to preserve life and to prevent or arrest physical deterioration until more extensive treatment can be given. With limited medical personnel, material and facilities, only emergency medical care may be possible and definitive treatment deferred until such time and place that required procedures may be properly carried out. Though emergency treatment is a primary function of aid stations, it may conceivably be required of any medical facility proximate to the source of mass casualties. Thus a hospital staffed and equipped for more definitive care may, in the initial 24 to 72 hours, of necessity render only emergency treatment. Penalties for delay in ideal management must be assumed. No treatment should be undertaken which would unwarrantedly cause a casualty to be less able to care for himself or which would jeopardize his probabilities for later more effective treatment. Contrarily, where possible, treatment should be as complete as possible and the patient returned to duty or a holding unit. Initially definitive treatment to hasten recovery and improve or correct functional impairment caused by trauma may be available only in facilities somewhat remote from the injury source.

b. Emergency medical care is concerned primarily with resuscitation and essential surgical procedures.

(1) Resuscitation will involve principally the treatment of shock following trauma. Early fluid replacement therapy may be limited by the amount of parenteral fluids available. When

possible, oral fluids should be used as the method of choice, or as an adjunct aimed at reducing the amount of parenteral therapy required. First priority for parenteral fluids should be given to patients in shock due to hemorrhage but whose bleeding has been controlled and to patients with burns of 20 to 40 percent of their body surface who cannot tolerate oral fluids.

(2) Essential surgery includes the following emergency procedures: ligation of accessible major vessels, tracheotomy, simple closure of sucking chest wounds with dressings, relief of tension pneumothorax by flutter valve, relief of hemothorax by aspiration, completion of partial amputations, removal of large foreign bodies from non-vital areas, splinting of major fractures, and wound dressing or reinforcement of dressings where indicated. The application of a tourniquet for the arrest of hemorrhage should be reserved for those cases which cannot be effectively treated with a firmly applied pressure dressing, or by ligation of a readily accessible vessel. A properly applied tourniquet will arrest hemorrhage but concomitantly accepts probably amputation of the extremity. A tourniquet should not be released or removed until exposure and ligation of the bleeding vessels can be accomplished. Promiscuous use of the tourniquet could result in an unwarranted sacrifice of many limbs.

c. Definitive medical care is concerned with the proper treatment of specific types of injuries, as discussed below.

(1) Missile wounds may involve any region of the body but approximately 60 percent are injuries of the extremities. Tissue destruction usually is not extensive in injuries produced by low velocity missiles. Normally, soft tissue wounds are effectively treated by careful debridement of all devitalized tissue and foreign material, with subsequent closure 4 to 10 days later. Initially, circumstances may permit only wound cleansing, relaxing incisions, removal of obviously devitalized skin and other tissue, counter drainage where indicated and dressing. Such wounds should not be packed but outer dressings be firmly applied to splint and to control oozing. Attention should be given to intact regional blood vessels and nerves. Liberal longitudinal division of compartmentalizing fascia is indicated. Immobilization of large wounds is protective against further hemorrhage

and shock. No primary suturing of soft tissue wounds should be done, for all such wounds are contaminated. Open fractures should be similarly treated and immobilized. Metallic fixation should be avoided. In joint injuries the capsule alone should be closed. Without exploration the extent and seriousness of injuries to the abdomen and thorax are difficult to determine. Simple wounds of entrance frequently lead to excessive visceral damage requiring skill and time to repair. Thoracic wounds may respond well to aspiration as indicated but those not doing so may be in need of extensive surgery. In both instances such time-consuming procedures must be deferred initially and primary attention be directed to the many with reasonable expectancy of survival.

(2) Thermal injuries may constitute a major medical problem in nuclear warfare.

(a) The percentage of surviving casualties having burns will vary widely according to circumstance. Flash burns of second degree do well without a covering dressing. The open or exposure treatment of burns is an accepted practice and initially may be the only method of treatment available. Sterile dressings, being a critical item, should be reserved for those casualties which, if protected, will be returned to duty, e. g., burns of hands and selected circumferential burns. Burns about the head and neck should be left exposed to the air. Second-degree burns are comparatively painful, and application of a simple bland ointment will afford considerable relief. Fluids should be used freely by mouth. Providing urine output is maintained, water by mouth should be fortified by the electrolytes salt and soda (3.0 gm NaCl and 1.5 gm  $\text{NaHCO}_3$ /liter water). All burn wounds are contaminated and antibiotic therapy should be started as soon as available. A large percentage of burn patients will have other associated injuries which will require surgical attention. Within hospital facilities, segregation of burn patients should be carried out if possible to avoid contamination of surgical facilities.

(b) The percentage of the body area burned is determined by the rule of nines, as shown:

(c) The formula below expresses the estimated fluid requirement during the first 24 hours for patients with 20-40 percent body area burns. During the second 24 hours, half of this amount

is required. Caution must be exercised in cases of respiratory tract burns because of an increased tendency to develop pulmonary edema. Tracheotomy is essential and should be done in most cases of respiratory tract burns.

Colloid (Blood, Dextran, etc.)	= Percent area burned $\times$ weight in lbs. $\times$ 0.50
Electrolyte	= Percent area burned $\times$ weight
Glucose in water	= 2,000 cc.

(3) Radiation injuries may be indicated by personnel dosimetry data. However, symptomatology and clinical findings must determine the need for medical care. Lacking specific preventive or curative therapy, this type of injury alone is no medical emergency. Non-activity should be recommended only if warranted by the serious clinical condition of the patient. The length of time interval between exposure and onset of symptoms forecasts the prognosis — the shorter the interval, the graver the prognosis. Hospital treatment, if necessary, should be directed toward maintenance of fluid and electrolyte balance, nutrition, rest, hemoglobin blood level of at least 10 grams and control of infection.

(4) Patients having radiation plus missile and/or thermal injuries should be treated as non-radiation cases until the contrary is evident. Every effort must be made to enhance early healing of wounds in cases of combined injuries.

(5) Psychiatric casualties. Early evidence of organization and the establishment of a functioning system of prompt medical care will contribute immediately to effective rehabilitation of patients with mental disorders. All psychotherapeutic measures should be undertaken in a group atmosphere with an attitude of expectancy for recovery. Treatment consists of simple direct interviews, reassurances, periods of rest, food, and participating duty in the disaster area. Little or no sedation is necessary or desired. Patients with frank psychoses must be treated accordingly.

d. Problems of special therapy, such as blood IV fluids, antibodies, biologicals, anesthesia, and sedation require separate consideration.

(1) Intravenous fluids and equipment may not be readily available. Water by mouth or water

reinforced with electrolytes (salt and soda) may be the only supporting fluids available. Hypodermoclysis which is simple in application, safe and relatively effective, may be used in lieu of intravenous therapy.

(2) The liberal use of whole blood and plasma expanders, such as plasma, serum albumin, and dextran, has become an established practice in the treatment of traumatic injuries. The use of each has presented its problem and research continues for better preparations and techniques. Volemic replacement therapy may be lifesaving and may be urgently indicated. During the emergency period of mass casualty management, the available blood and plasma volume expanders must be reserved for those patients in the immediate and delayed treatment groups, who may benefit most from the available fluids. Blood should not be given unless hemorrhage can be controlled readily.

(3) Antibiotics, if available, should be given for most injuries. Open wounds and burns are contaminated and early systemic antibiotic treatment should promote healing. Local antibiotic treatment is not recommended except for body cavities and joint spaces. Continuation of therapy for 5 days is desirable. A long-acting penicillin or broad spectrum antibiotic is preferred. Oral administration may be mandatory. The patient's clinical condition and availability of supplies will determine the agent employed and the route of administration, the dosage and duration of treatment. Regardless of the antibiotic employed, the development of resistant bacterial strains and secondary infections is expected. Provision should be made for the utilization of additional antibiotics at a later date.

(4) The biological product to be considered in the care of mass military casualties is tetanus toxoid. Assuming that all military personnel will have received the mandatory tetanus toxoid immunization, a booster dose at the time of injury can be omitted with reasonable safety. Casualties who have received only two initial immunizing doses require a stimulating dose (1.0 cc.) as soon as practicable following injury. Civilian personnel lacking immunization should be administered tetanus antitoxin (3,000 u.) as early as possible.

(5) Anesthetics, analgesics and sedatives will be needed in the treatment of mass casualties. The anesthetic employed will depend on the

availability of agents and personnel qualified in their use. Facilities employing anesthetics for surgical procedures may be restricted to open ether or chloroform with administration by less qualified personnel under supervision. Local anesthesia may be prevalent. Intravenous barbiturates should not be used in patients who have face, neck, or chest injuries. Frequently pain can be controlled by mild analgesics, such as aspirin or codein. When severe pain requires more potent drugs, such as morphine or demerol, the intravenous route is preferable. Oral barbiturates are recommended when sedation is required, but their use should be kept to a minimum. Any opiate or barbiturate reduces the ability of the patient to care for himself.

**Evacuation and Disposition.** a. Orderly evacuation and timely disposition of patients are essential for efficient medical service. In nuclear warfare, the large numbers of injured and limited medical resources immediately available increase the importance of proper evacuation and disposition.

b. The responsibility for rescue and transportation of patients from the area of damage to the first medical facility must be fixed in every Disaster Plan. Clearance of heavy wreckage which may be essential to rescue efforts is a normal function of elements of Civil Defense other than the medical service. As stated previously, the principle of economic utilization of medical efforts precludes the use of trained medical personnel for first aid or rescue operations.

c. Medical evacuation begins at the forward aid stations (sorting stations) located or set up at the periphery of impact areas. It is directed rearward to supporting medical facilities. Priorities for evacuation are established through sorting of the injured at forward medical units. The rate of evacuation is influenced by the mode and availability of transportation and is regulated by the capabilities of supporting medical installations.

d. Under the conditions imposed by mass casualties, the conventional criteria for discharge of patients from medical treatment facilities must be modified. Medical treatment facilities must be cleared rapidly of all patients who are capable of duty or self-care. Care of these individuals is the function of holding-type units and not medical treatment facilities.



e. It is anticipated that the situation will not permit conventional evacuation of patients during the immediate post-impact period. However, individuals requiring long-term hospital treatment or those not expected to contribute to the local mission should be further evacuated at the earliest opportunity. Medical treatment facilities adjacent to mass casualty areas must not become paralyzed with the details of lengthy post-operative care.

**Records.** a. Medical records are indispensable adjuncts to proper medical care. Admission and disposition lists are essential in controlling patient flow between and within medical treatment facilities.

b. The minimum requirements for medical records include essential identifying and relevant medical data and a simple system for periodic admission and disposition reporting. Pertinent data should be documented on standard medical records, although prevailing circumstances may preclude entering all the requested information. Baggage tags or other suitable improvisations can be used to supplement supplies of standard medical field forms.

**Preventive Measures.** a. The number of casualties resulting from nuclear warfare can be reduced appreciably through general application of individual and unit protective measures. Complete protection from a direct hit cannot be expected, but prevention of injury can be appreciable in other areas.

b. For individuals the protective value of fox-holes, trenches, field fortifications and other type shelters is known, and their construction and use should be routine. Good clothing discipline will reduce the number and severity of flash burns through the shielding afforded by helmets, rolled-down sleeves, and gloves. Individual evasive action immediately after a detonation will decrease missile injuries, and in some instances reduce thermal and nuclear radiation injury.

**Plans and Training.** Professional personnel may be utilized to better advantage in supervising rather than performing actual patient care, which in this event would be performed by paramedical personnel. Non-professional personnel may be used to supervise locally recruited individuals, particularly for administrative and logistic support. Within medical organizations, efficiency will depend upon controlled patient

flow, adequate supplies, and continuing essential housekeeping and administrative functions.

**Supply.** In mass casualty situations, availability of supplies will be vital to the successful accomplishment of the medical service mission. Universal stringent supply economy must be enforced; for example, discarding of any usable material is prohibitive. Rigorous control and conservation of supplies will be mandatory. For effective supply function during emergencies:

a. All medical facilities must have maintained authorized stock levels.

b. Reserve medical supplies for use in mass casualty treatment should have been planned and programmed. Such reserves should be packaged in small portable units designated for treatment of burn and traumatic injuries, and be dispersed to known protected stations within each medical facility. Expiration-date items should be regularly rotated to current stocks.

c. Practical planning for improvisation of essential supplies should have been carried out, for example: salvaged metal food containers may serve as dishes for mass feeding, hospital linen may be converted to bandages, or soiled dressings washed and sterilized for re-use.

d. Coordinated planning with adjacent medical or other technical units for essential supply items must have been accomplished.

#### EDITOR'S NOTE:

The above data was taken bodily from TB Med 246, Department of the Army Technical Bulletin.\* It is their most recent compilation summarizing the medical management under these difficult circumstances. However, it does rather fully present a problem that we must anticipate and for which we must be prepared. Periodically in forthcoming issues specific articles are to be taken from the April 1956 issue of the Journal MILITARY MEDICINE. This was a symposium for the handling of the casualties in nuclear warfare, written by national authorities in their specific fields. Permission has been obtained for republication. Should you desire to obtain their complete 188 page reprint, it is available for \$1.50 in the paper back cover or \$3.00 in the buckram binding. Address any request to: Colonel Robert E. Bitner, Secretary-Editor, MILITARY MEDICINE, Suite 718, New Medical Building, 1726 Eye Street, N. W., Washington 6, D. C.

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## HOSPITAL BENEFIT ASSURANCE

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MEDICAL DIRECTOR  
DUKE R. GASKINS, M. D.



Dear Doctor:

Season's Greetings to each of you.

It is my wish that 1957 brings you good health, good fortune, and continued success, and that we can continue to work together as we have in the past.

And so, doctor, for the holiday season, MERRY CHRISTMAS and HAPPY NEW YEAR!

Sincerely yours,

HOSPITAL BENEFIT ASSURANCE

Duke R. Gaskins, M. D.

DRG:sk

# Organization PAGE

By Norman A. Ross, M.D.

**T**HE MEDICAL Society of the United States and Mexico, the organizational meeting of which was held November 24, 1956, at the Pioneer Hotel in Tucson, is a thing that can mean much to the states of Sonora, Sinaloa, Jalisco, and Arizona. This organization has the endorsement and support of the heads of state and can, therefore, be expected to continue and succeed.

• • •

In December, we man a nationally subsidized military Dependent's Act. We are informed that present plans allow that this program will be brokered through a mutual publicly-owned agency of our choosing. The agency will accept this. This subsidized program will be further softened by additional brokers at the national level. From some of the discussion, it would appear that this program is considered by at least some physicians as "creeping socialism".

On July 1, 1957, we physicians will be called on to certify a half million or so persons retiring under Social Security Law. These people will range in age from fifty to sixty-five and will be **presumed to be** permanently disabled. This service will be — by, of, and for — the welfare and vocational training agencies of government. Some of our fellows may see this as socialism.

• • •

A modern school of nursing is included in the budget of the University of Arizona at Tucson and Arizona State College at Tempe for 1957.

• • •

## A NEW BLUE CROSS-BLUE SHIELD BUILDING

This new structure will be located at 331 West Indian School Road, Phoenix, Arizona. It will consist of 15,500 square feet and will be built at a bid cost of \$174,814.

The need for additional space is apparent when we are acquainted with the fact that during the period from December 31, 1951 to December 31, 1955, the plan's combined membership grew from 213,881 to 288,316.

Blue Cross-Blue Shield will continue to main-

tain enrollment branch offices in Tucson and Flagstaff.

• • •

**THE SECRETARY'S LETTER**, American Medical Association, 535 North Dearborn Street, Chicago 10, Illinois.

Announcement is made of the A.M.A. Clinical Session in Seattle, November 27-30 and sounds interesting.

The scientific program will be beamed at the general practitioner, and subjects have been carefully chosen to be of interest and practical value. The program will include panel discussions, individual papers, motion pictures and closed-circuit television clinics.

There will be 45 papers dealing with such subjects as fluid balance, urological problems, office psychiatry, varicose veins, fractures, diabetes and heart disease. Well-known medical educators and practicing physicians from all parts of the country will participate.

The television clinics will include both wet (operative) and dry (non-operative programs). Talent will be drawn largely from Seattle because of the necessity of rehearsals and frequent briefing. There will be clinics on block anesthesia, treatment of burns, bleeding problems, intestinal obstruction, caesarean section, hand surgery, vein stripping and other subjects.

**300 STUDY MEDICAL PUBLIC RELATION FOR TWO DAYS** at the American Medical Association's Public Relations Institute in Chicago. These people learned the Public Relations value of local science fairs, something about the methods used to teach new medical society members about organized medicine, how medical societies make their voices heard in legislative halls and what goes into the planning, producing and promoting of local radio and television programs.

Public Relations at a national level were discussed with the following comment:

It isn't easy to select the highest priority issues. Shortages of physicians, actual or alleged, costs and methods of financing medical care, A.M.A.'s relations with other national or-

ganizations, national legislation and national political developments are the subjects that warrant particularly close scrutiny."

#### A.A.G.P. DEDICATION ADDRESS

"If the cost of all new medical and health facilities — hospitals, medical schools, medical society buildings, doctors' offices and other structures — during 1955 is added up, we would probably get a figure near one and a half billion dollars."

\* \* \*

The Arizona Association of Nursing Homes at its second Institute at the Santa Rita Hotel, Tucson, Arizona, October 11, 1956, presented its general purposes:

"To promote the welfare of the people through the development of responsible and adequate nursing and convalescent home service in Arizona.

"To aid in the promotion of a code of ethics designed to regulate and elevate the standards of nursing and convalescent homes.

"To make available to physicians, hospitals and the public, a registry of qualified nursing and convalescent homes.


"To encourage professional education and scientific research in the problems and care of the aged and sick; Cooperate with public health agencies and with other organizations having similar objectives; and to do all things which may best promote the efficiency and adequacy of nursing and convalescent homes."

#### ANALGESIC

IN THE never-ending search for the ideal analgesic many compounds have been tried. At first they are exploited as the perfect pain reliever only to be put aside or be changed into newer compounds. Meperidene or Demerol is now in this category. When first marketed it was claimed to be the perfect analgesic. Eventually it found its proper place. Now the chemists have succeeded in splitting one of the bonds in the Meperidene molecule without completely destroying the analgesic effects. The advance reports make claims that the new compound is analgesic yet not addicting. As yet, the new compound has no name. Identified only by a code number, this preparation has been tried with favorable results in animal studies. It is now, or shortly will be available for clinical testing in human subjects.

Antos

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AND  
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ATARAXOID is a unique, new combination of STERANE and ATARAX, which now permits simultaneous symptomatic control and reduction of attendant anxiety and apprehension in rheumatoid arthritis and other indications.

The added tranquilizer control, desirably easing mental stress, also directly assists clinical progress. It minimizes the chance of exacerbation related to emotional strain and facilitates patient confidence and cooperation in the therapeutic program toward maximum rehabilitation.

ATARAXOID exerts the anti-rheumatic, anti-inflammatory activity of STERANE distinctly superior to previous steroids, effective in radically reduced dosage, and with minimal disturbance of electrolyte and fluid metabolism.

The ataractic effect is a central neuro-relaxing action — the result of a marked cerebral specificity — free of mental fogging and devoid of any major complications: no liver, blood or brain damage. This peace-of-mind component is also used in the lowest dosage range.

Supplied: Each green, scored, ATARAXOID oral tablet contains 5 mg. prednisolone (STERANE) and 10 mg. hydroxyzine hydrochloride (ATARAX). Bottles of 30 and 100.

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the first  
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ataraxic-corticoid

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prednisolone and hydroxyzine

*Pfizer*

combining the newest, safest  
tranquilizer, ATARAX® + the newest, most effective  
steroid, STERANE®  
(prednisolone)

*simultaneously* controls  
the symptoms and the  
apprehension

In Rheumatoid Arthritis,  
other collagen diseases,  
bronchial asthma and  
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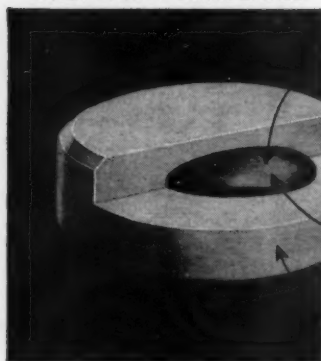
\*Trademark

**NEW**

**For Pain-Free**  
*of every*  
**In "Rheumatism"**

**Multi****TEMP***combine:*

THE PROPER FORMULA  
 PROPERLY FORMULATED

**PREDNISOLONE** (1.....

+

**ASPIRIN** (0.3 Gm.).....

+

**ASCORBIC ACID** (50.....

+

**ANTACID** (0.2 Gm.).....

*Physical separation of the steroid component from the aluminum hydroxide as provided by the Multiple Compressed Tablet construction assures full potency and stability of prednisolone.*

*Early rheumatoid arthritis	Synovitis
Rheumatoid spondylitis	Tenosynovitis
Osteoarthritis	Myositis
Still's disease	Fibrositis
Psoriatic arthritis	Neuritis
Bursitis	

Performance

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..... for anti-inflammatory, anti-rheumatic benefits  
at effective low dosage.

..... for analgesia plus additional anti-rheumatic  
activity.

(5) ..... for anti-stress support that guards against ad-  
renal ascorbic acid depletion.

(Ascorbic Acid present as 60 mg. Sodium Ascorbate.)

..... dried aluminum hydroxide gel minimizes the  
possibility of gastric distress.

**DOSAGE:** 1-4 TEMPOGEN Tablets t.i.d. or q.i.d.  
(TEMPOGEN Forte, 1 or 2 tablets t.i.d. or q.i.d.)  
for one or two weeks. Then lower by 1 tablet every four  
or five days to maintenance level.

**SUPPLIED:** TEMPOGEN and TEMPOGEN Forte  
—in bottles of 100 Multiple Compressed Tablets.  
(TEMPOGEN Forte provides 2 mg. of prednisolone.)



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## UNIFORM CHEMICAL LABELING LAW PROPOSED

**T**HE AMERICAN Medical Association's Board of Trustees has authorized a first step toward protecting the public from potentially dangerous household and commercial chemicals.

The board authorized the A.M.A. committee on toxicology to draft a recommended "model" law on labeling of many possibly harmful chemicals not now regulated.

It would serve as a guide for writing regulations which would require labels to show such information as the product's contents, its possible dangers, directions for safe use, and first aid instructions.

Products involved include auto care and repair materials, paints and paint removers, putty, soldering fluids, household cleansers and polishers, heating and cooking fuels, laundering items, art supplies, and toys containing chemicals.

The committee's secretary, Bernard E. Conley, estimates there are at least a quarter of a million different trade-name substances now on the market. Without proper labeling, physicians and the public cannot possibly know what harmful material they may contain or how to treat poisoning from them.

The law should be an "enabling act" under which later regulations could spell out necessary details for enforcement and compliance, according to Dr. Torald Sollmann, Cleveland, committee chairman. The legislation should be flexible and not readily out of date.

## CIRRHOSIS

**A** NEW concept is emerging concerning the role of high protein diets in the treatment of liver disease. While a high protein intake is still part of the recognized therapy for many liver derangements, it has been found that in certain patients with advanced cirrhosis (scarring) of the liver that protein may actually be toxic. It is felt that one cause of the destructive effects observed is the ammonium released in the digestive tract when protein is broken down. While patients with normal or slightly malfunctioning livers can convert ammonium into harmless products, patients with severe liver disease often have increased blood ammonium concentrations which may lead to hepatic coma.

Antos

## NEWS NOTICE

**T**HE FORD Foundation has granted \$22,000,000 to aid private Medical Schools. Forty-three four-year schools will receive \$500,000 each while the two-year Medical School at Dartmouth College will receive \$250,000. These grants form a part of \$90,000,000 to be distributed by the Foundation to aid the various private Medical Schools of the country.



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# Woman's AUXILIARY

## GILA COUNTY MEDICAL SOCIETY

CAN YOU remember when it was an elaborate evening to attend the County Medical Society's meetings? The doctors got out their tuxedos and the ladies wore evening gowns and the dinners served were just as nice as possible. The monthly meetings of the Gila County Medical Society are no longer quite that elaborate but because of its size the monthly county medical society meetings are done a little differently than in the larger societies in Arizona.

The Gila County Medical Society meets the third Thursday of each month, except during the summer, for a dinner meeting which is usually held at the Country Club. The wives, nine times out of ten, are members taking their turns as hostess. After the social portion of the evening the women adjourned to a separate room where they hold their Auxiliary meeting, after which, time permitting, bridge or some other game takes over.

The doctors hold their business meetings, which are generally short, and then they have a program. The speaker often is one of the specialists in medicine or surgery from Phoenix. If the program is of interest to the women, they are invited to that portion of the meeting.

Doctor and Mrs. Hazel drive to Globe from Hayden, 60 miles of mountain driving, to attend the meetings.

The membership of the Woman's Auxiliary to the Gila County Medical Society fluctuates but there are always about 11 or 13 active members. When the new Gila General Hospital was built in Globe six years ago, the Auxiliary had two benefit card parties and raised sufficient funds to furnish one of the private rooms in the hospital.

In the past three years we have worked diligently on the Nurse Recruitment Program and have sponsored weekly thirty minute radio programs on various health problems, the material for these broadcasts being obtained from the American Medical Association.

The Auxiliary members for two years assisted the local chapter of the Arizona Society for

Crippled Children in conducting audiometer tests on the children in the schools in the Globe-Miami district.

Last year the Gila County Auxiliary members did an outstanding job with subscriptions of Today's Health. We secured 185% of our quota — every member purchased a personal subscription plus an extra one. The extra subscriptions were donated to the two public libraries, dentist's waiting rooms, beauty parlors, and the libraries of the high schools.

As you know the 1956-57 national theme of the Woman's Auxiliary to the American Medical Association is HEALTH IS OUR GREATEST HERITAGE. In this connection and in cooperation with the Committee on Mental Health, our project this year is to mail to every high school senior in Gila County (Globe, Miami, Payson, Hayden, Young) the series of nine letters entitled, Milestones to Marriage. Wherever we have discussed this project, it has been accepted with great enthusiasm. We have even been asked for several extra sets of the letters so that the high school teachers can use them to initiate discussion groups in the Social Science classes. The Auxiliary intends to offer the services of our doctors or their wives for private or group discussions on any phase of these letters. We are very anxious to get this project under way and believe it will stand out among our more worthwhile projects.

All in all, even though the Women's Auxiliary to the Gila County Medical Society is a very small group, we are trying to uphold the objectives of the Women's Auxiliary to the American Medical Association by —

Assisting the American Medical Association in its program for the advancement of medicine and public health, and

To cultivate friendly relations and promote mutual understanding among the physicians' families.

Mrs. William E. Bishop, President  
Woman's Auxiliary to the  
Gila County Medical Society.

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*Journal of*  
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Infections of the respiratory tract respond readily to

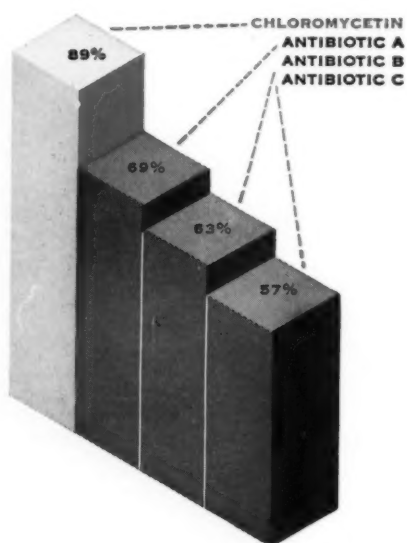
# ILOTYCIN

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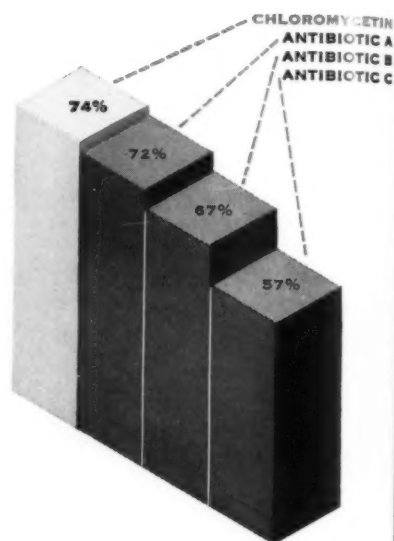
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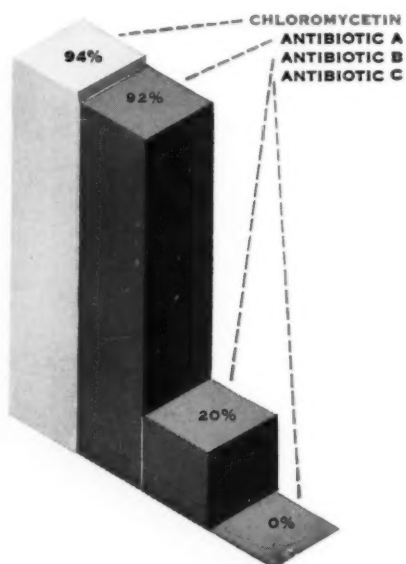
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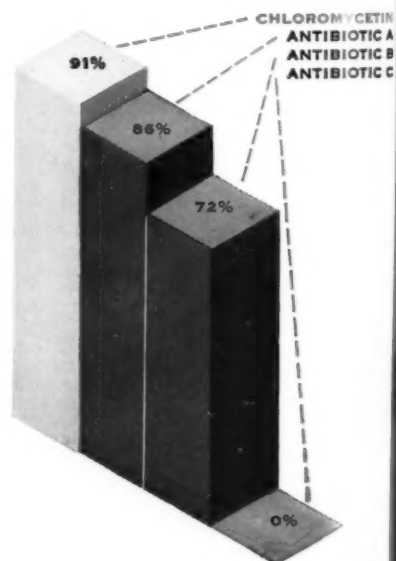
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Because of the increasing emergence of pathogenic strains resistant to commonly used antibiotics, judicious selection of the most effective agent is essential to successful therapy. *In vitro* sensitivity studies serve as a valuable guide to the antibiotic most likely to be most effective. Both clinical experience and sensitivity studies indicate the greater antibacterial efficacy of CHLOROMYCETIN (chloramphenicol, Parke-Davis) treatment for many resistant infections.<sup>1-7</sup>

CHLOROMYCETIN is a potent therapeutic agent and, because certain blood dyscrasias have been associated with its administration, it should not be used indiscriminately or for minor infections. Furthermore, as with certain other drugs, adequate blood studies should be made when the patient requires prolonged or intermittent therapy.

**References** (1) Altemeier, W. A.; Culbertson, W. R.; Sherman, R.; Cole, W.; Elstun, W., & Fultz, C. T.: *J.A.M.A.* 157:305 (Jan. 22) 1955. (2) Austrian, R.: *New York J. Med.* 55:2475 (Sept. 1) 1955. (3) Murphy, F. D., & Waisbren, B. A., in Murphy, F. D.: *Medical Emergencies: Diagnosis and Treatment*, ed. 5, Philadelphia, F. A. Davis Company, 1955, p. 557. (4) Weil, A. J., & Stempel, B.: *Antibiotic Med.* 1:319, 1955. (5) Jones, C. P.; Carter, B.; Thomas, W. L., & Creadick, R. N.: *Obst. & Gynec.* 5:365, 1955. (6) Kass, E. H.: *Am. J. Med.* 18:764, 1955. (7) Tebrock, H. E., & Young, W. N.: *New York J. Med.* 55:1159 (Apr. 15) 1955.

graph is adapted  
Altemeier, Cul-  
Sherman, Cole,  
& Fultz.<sup>1</sup>



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Karo permits easy adjustment of

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in inflammatory skin diseases



all the benefits of the "predni-steroids"  
plus positive antacid action  
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Multiple  
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Clinical evidence<sup>1,2,3</sup> indicates that to augment the therapeutic advantages of prednisone and prednisolone, antacids should be routinely co-administered to minimize gastric distress.

References: 1. Boland, E. W., J.A.M.A. 160:613, (February 25,) 1956. 2. Margolis, H. M. et al, J.A.M.A. 158:454, (June 11,) 1955. 3. Bollet, A. J. et al, J.A.M.A. 158:469, (June 11,) 1955.

2.5 mg. or 5 mg.  
prednisone or  
prednisolone with  
50 mg. magnesium  
trisilicate and  
300 mg. aluminum  
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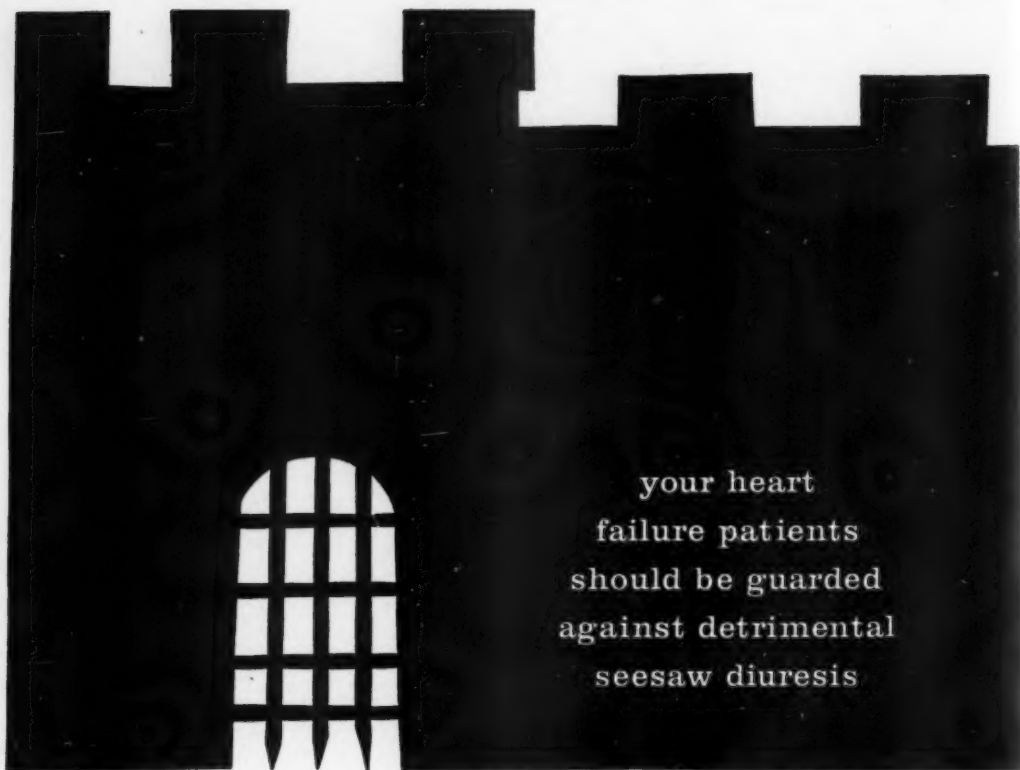
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In addition to its gentle anti-hypertensive action, Rauwiloid provides psychic tranquility and overcomes tachycardia. Thus Rauwiloid participates in *both* the somatic and psychic phases of therapy for hyper-

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Dosage is definite and easy:  
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in therapeutic  
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*a new maximum  
in protection  
against  
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multi-spectrum  
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*a new certainty*  
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particularly for  
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## "Bon Appetit"

**for the Geriatric  
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Few substances compare with wine in its record of continuous use as an appetite stimulant, as a pleasant, nutritious adjuvant to the diet, and as a gentle medicinal agent.

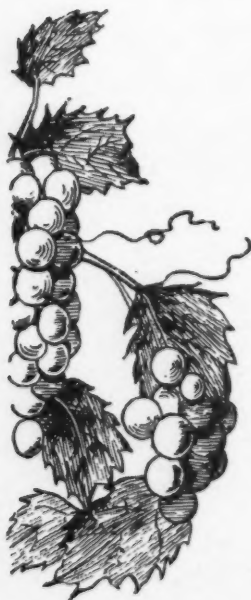
Notably in the dietetic management of the aged, the convalescent and the post-surgical patient, wine has occupied a foremost position for generations—but it is only of recent times that its distinctive physiologic values and clinical rationale have been systematically studied and evaluated.

Thus it is now known that—

- wine stimulates olfactory acuity—markedly increasing appetite in anorexia
- wine serves as a quick-energy food. Its small amount of hexose is speedily absorbed and its moderate content of alcohol is metabolized readily even by diabetics
- wine possesses significant vasodilating, diuretic and relaxing properties of value in the field of cardiology
- a little Port or Sherry at bedtime is a valuable relaxant to the insomniac and may obviate the need for sedative medication

And wine can help brighten the often unappealing character of special or restricted dietaries—a psychological boost of inestimable value to the debilitated and depressed patient.

These and other research data of clinical interest are contained in the brochure "Uses of Wine in Medical Practice." A copy is available to you by writing: Wine Advisory Board, 717 Market Street, San Francisco, California.





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## 5-way approach

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Vitamin C	50.0 mg.
(2) Phenylephrine Hydrochloride	5.0 mg.
(3) Prophepridine Maleate	8.25 mg.
Methapyridine Hydrochloride	8.33 mg.
Pyrimidine Maleate	8.33 mg.
(4 & 5) Salicylamide	200.0 mg.
Acetophenetidin	120.0 mg.
Caffeine Alkaloid	30.0 mg.

Each 5 cc. (teaspoonful) of CITRA SYRUP contains:

(1) Hesperidin Methyl Chalcone (Citrus Bioflavonoid)	8.33 mg.
Vitamin C	30.0 mg.
(2) Phenylephrine Hydrochloride	2.5 mg.
(3) Prophepridine Maleate	2.5 mg.
Pyrimidine Maleate	3.33 mg.
(4) Dihydrocodeinone Bitartrate	1.66 mg.
(5) Potassium Citrate	150.0 mg.
In a flavored syrup base. Alcohol 2% Exempt Narcotic	

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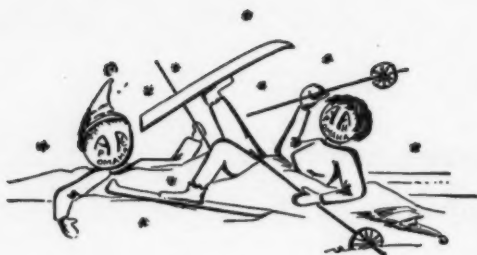
Both Citra formulas available at all prescription pharmacies. Citra Capsules packaged in bottles of 100 and 1000. Citra Syrup in pints and gallons. Literature on request.

### BIBLIOGRAPHY:

Steinberg, Harry; Use of Double Antihistamine in the Treatment of Allergies, *Annals of Allergy* 13:183, 1955 • Sobeloff, B.; The Capillary Syndrome in Viral Infections, Treatment with Citrus Flavonoids, *Am. J. Digestive Diseases*, 22:7, Jan. 1955. • Biskand, Morton S. and William Coda Martin: "The use of Citrus Flavonoids in Respiratory Infections" *Am. J. of Digestive Diseases*, 22, No. 2, 41, February 1955. • Boines, George J.; *Annals of New York Academy of Sciences*, 61:3721, 1955. • Srilanana, G. J., and S. Horvachuk, 1950. The treatment of Capillary fragility with Hesperidin and Vitamin C. *Am. J. Digestive Diseases*, 17:92.

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OMAHA 2, NEBRASKA**

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WHO SUFFERS  
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MENOPAUSE  
DESERVES  
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natural, oral  
estrogen*

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*Symptomatic  
relief...plus!*



# Achrocidin\*

Tetracycline-Antihistamine-Analgesic Compound

ACHROCIDIN is a comprehensive formula for treatment of complications of the common cold, particularly when bacterial sequelae are observed or expected from the patient's history or during widespread infections.

Distressing symptoms of malaise, headache, muscular pain, mucosal and nasal discharge are rapidly relieved.

And potent prophylaxis is offered against other diseases, such as otitis media, sinusitis, adenitis, and bronchitis, to which the patient may be highly vulnerable at this time.

ACHROCIDIN is convenient for you to prescribe—easy for the patient to take. Average adult dose: two tablets four times daily.

*Available on prescription only*

Each tablet contains:

ACHROMYCIN® Tetracycline .....	125 mg.
Phenacetin .....	120 mg.
Caffeine .....	30 mg.
Salicylamide .....	150 mg.
Chlorothen Citrate .....	25 mg.

Bottle of 24 tablets

**Lederle**

LEDERLE LABORATORIES DIVISION, AMERICAN CYANAMID COMPANY, PEARL RIVER, N. Y.

\*TRADEMARK

# Erythrocin in treating tonsillitis and otitis externa\*

2/22/56

## DISCHARGE SUMMARY

Patient, white male, age 4, entered the clinic on 2/13/56, with a history of yellow discharge from the right ear, a fever, and sore throat of two days duration.

Temperature orally was 100°, pharynx infected, tonsils inflamed, crusted purulent material seen in right ear canal; tympanic membrane normal. Diagnosis -- tonsillitis and otitis externa.

Culture revealed Staphylococcus aureus, coagulase positive, resistant to penicillin and sensitive to erythromycin.

ERYTHROCIN (erythromycin) was started in doses of 25 mgm/kg -- 400 mgm in 4 equally divided doses.

After 24 hours of therapy, patient was afebrile and comfortable. T=99.6. Throat slightly infected. Secretions in ear canal were dry and both tympanic membranes were normal.

Culture on 2/15 showed no coagulase positive staphylococci or other pathogens. On 2/22, follow-up exam showed him to be completely asymptomatic and free of unusual physical findings. The drug was stopped at this time.

Final Diagnosis: tonsillitis and otitis externa due to Staphylococcus aureus.

Result: complete clinical bacteriologic cure after 9 days with ERYTHROCIN therapy.

\*Communication to Abbott Laboratories

*"clinical response  
good or excellent"*

In one recent study, 18 patients with acute follicular tonsillitis and septic sore throat, were given erythromycin. Infecting organism was *Str. pyogenes*. The investigator stated, "In all 18, the clinical response could be regarded as either good or excellent."

This, of course, is only one of many reports showing the effectiveness of ERYTHROCIN against coccic infections. You'll get the same good results (nearly 100% in common, bacterial respiratory infections) when your prescription reads *Filmtab* ERYTHROCIN Stearate.

*"toxicity lower  
in erythromycin-treated  
patients"*

After a study of 208 patients treated with erythromycin (78), procaine penicillin (78) and a placebo (52), the investigator stated: "... the incidence of toxicity (compared to procaine penicillin) was significantly lower in the erythromycin-treated patients."

Actually, ERYTHROCIN stands on a remarkable record of safety. After four years, there's not a single report of a severe or fatal reaction attributable to erythromycin. Also, allergic reactions rarely occur. *Filmtab* ERYTHROCIN Stearate (100 and 250 mg.), is available in bottles of 25 and 100, at all pharmacies.

Abbott



® Filmtab—Film sealed tablets, Abbott; pat. applied for.

1. Herrell, W. E., Erythromycin, Antibiotics Monographs, No. 1, p. 29, New York, Medical Encyclopedia, Inc., 1955.

Idem p. 30.

**Erythrocin<sup>®</sup>** STEARATE  
(Erythromycin Stearate, Abbott)

Combined for a  
on  
resistant

*New*

## METRETON *tablets*

**METICORTEN (PREDNISONE) PLUS CHLOR-TRIMETON WITH ASCORBIC ACID**

*For prompt and effective relief, especially in many resistant allergic disorders, METRETON affords the benefits of two established agents with unexcelled anti-inflammatory, anti-allergic and antipruritic effectiveness. supported by essential vitamin C—for stress support and for postulated effect on prolonging steroid action no better corticosteroid—original brand of prednisone...minimal electrolyte effects—METICORTEN no better anti-histamine—unexcelled in potency and freedom from side effects—CHLOR-TRIMETON effective against hay fever, pollen asthma, perennial rhinitis, acute and chronic urticaria, angioneurotic edema, drug reactions, inflammatory and allergic eye disorders, pruritic and contact dermatoses.*

*formula:* Each tablet of METRETON provides 2.5 mg. of METICORTEN (prednisone), 2 mg. of CHLOR-TRIMETON maleate (chlorphenpyridamine maleate), and 75 mg. ascorbic acid.

*supplied:* METRETON Tablets, bottles of 30 and 100.



# a frontal attack allergies

*New*

## **METRETON** *Nasal spray*

METICORTEZONE (PREDNISOLONE) PLUS CHLOR-TRIMETON

quickly clears nasal passages • avoids rebound engorgement and sympathomimetic side effects • safe even for cardiacs, hypertensives, children, pregnant patients •

**Composition:** Contains 2 mg. (0.2%) METICORTEZONE acetate (prednisolone acetate) and 3 mg. (0.3%) of CHLOR-TRIMETON gluconate (chlorpheniramine gluconate) in each cc.

**Packaging:** 15 cc. plastic "squeeze" bottle, box of 1.

METRETON,\* brand of corticoid-antihistamine compound; METICORTEN,\* brand of prednisone; METICORTEZONE,\* brand of prednisolone; CHLOR-TRIMETON,\* brand of chlorpheniramine preparations. \*T.M.

MT-J-376

*Schering*





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The new name has been adopted  
to make easier for everyone

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Now simply write:

*'Lanoxin' Tablets 0.25 mg. or 0.5 mg.  
'Lanoxin' Elixir Pediatric, or  
'Lanoxin' Injection*

to provide the unchanging safety and predictability afforded by the uniform potency, uniform absorption, brief latent period and optimum rate of elimination of this crystalline glycoside.

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Ampuls: 0.5 mg. in 2 cc.



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Sinus Drainage and Aeration**

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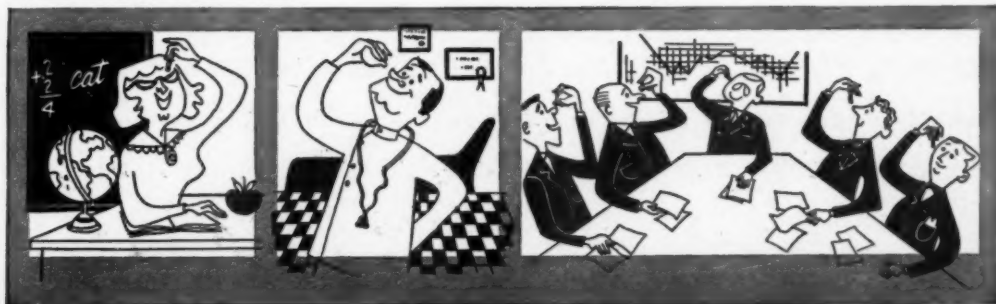
**\*Pediatric Nasal Spray 0.25%,**

with Zephiran<sup>®</sup> chloride 1:5000,  
antibacterial wetting agent and preservative  
for greater efficiency

} *plastic, unbreakable  
squeeze bottle  
leakproof, delivers  
a fine mist*

Neo-Synephrine (brand of phenylephrine)  
and Zephiran (brand of benzalkonium,  
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NEW YORK 18, N. Y. • WINDSOR, ONT.



"You try  
to scrub the  
bathtub  
with your  
back aching  
morning  
till night!"

"I don't know  
about bathtubs,  
but two days  
ago I couldn't  
reach a  
shelf higher  
than that."

"I thought maybe  
I slept in a  
draft. Never had  
a stiff neck  
like this before."

"That's nothing.  
I went around  
with my arm in  
a sling for  
nearly two weeks—  
had to sleep  
with a pillow  
at my back  
so I wouldn't  
roll over on it."

"I thought  
I was getting  
too old  
for high heels—  
low heels  
didn't help.  
My leg hurt  
down to  
the ankle."

"That's funny.  
I'm on my  
feet all day  
but it was  
my arms that  
bothered me."



...safeguarded relief all the way across the sp

**Prednisone + Acetylsalicylic Acid + Aluminum Hydroxide + Ascorbic Acid**  
Potent corticosteroid anti-inflammatory action complemented by rapid  
analgesia; doubly protected with antacid and supplemental vitamin C



's funny.  
on my  
all day  
t was  
arms that  
ered me

"Good?—  
why, he's  
got me doing  
exercises  
I haven't done  
in years."

"I hope  
he helps  
my knee  
that quick."

# the spread of common rheumatic complaints

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rapid  
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  - for the initiation of treatment of milder rheumatic disease
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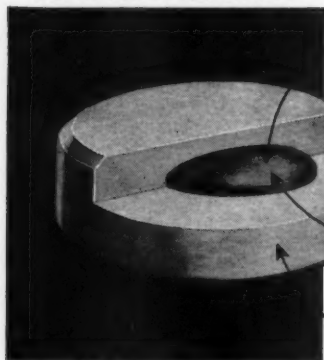
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*Physical separation of the steroid component from the aluminum hydroxide as provided by the Multiple Compressed Tablet construction assures full potency and stability of prednisolone.*

**PREDNISOLONE (1 mg.)**.....

+

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+

**ANTACID (0.2 Gm.)**.....

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mg.) ..... for anti-inflammatory, anti-rheumatic benefits  
at effective low dosage.

..... for analgesia plus additional anti-rheumatic  
activity.

0 mg. .... for anti-stress support that guards against ad-  
renal ascorbic acid depletion.

(Ascorbic Acid present as 60 mg. Sodium Ascorbate.)

..... dried aluminum hydroxide gel minimizes the  
possibility of gastric distress.

**DOSAGE:** 1-4 TEMPOGEN Tablets t.i.d. or q.i.d.  
(TEMPOGEN Forte, 1 or 2 tablets t.i.d. or q.i.d.)  
for one or two weeks. Then lower by 1 tablet every four  
or five days to maintenance level.

**SUPPLIED:** TEMPOGEN and TEMPOGEN Forte  
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(TEMPOGEN Forte provides 2 mg. of prednisolone.)



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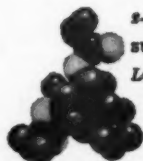
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*SUPPLIED: 400 mg. scored tablets. Usual dose: 1 or 2 tablets i.i.d.*

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prevents postpartum hemorrhage  
speeds uterine involution



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'Ergotrate Maleate' almost completely eliminates the incidence of postpartum hemorrhage due to uterine atony. Administered during the puerperium, 'Ergotrate Maleate' increases the rate, extent, and regularity of uterine involution; decreases the amount and sanguineous character of the lochia; and decreases puerperal morbidity due to uterine infection.

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Ampoules of  
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Tablets of 0.2 mg.

**dosage:** Generally, 0.2 to 0.4 mg. I.V. or I.M. immediately following delivery of placenta. Thereafter, 0.2 to 0.4 mg. three or four times daily for two weeks.

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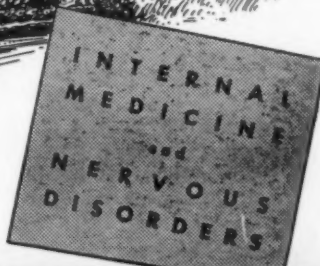
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... usually within 15 minutes  
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... usually for 6 hours  
seldom constipates

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\*Modell, W.: The Relief of Symptoms, Phil-  
 adelphia, W. B. Saunders Company, 1955,  
 pp. 265-266.

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**Improved  
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**FORTIFIED** — with Sodium Lauryl Sulfate  
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**DETERGENT** — High surface activity in acid  
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**ETHICALLY PKGED, net wt.**  
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with mild daytime sedation

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**IDEAL ANALGESIC/SEDATIVE  
 FOR DAYTIME USE**

**controls pain *faster***  
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 hexobarbital swiftly controls pain-  
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**with safety**


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Acetophenetidin gr. 2½, Acetylsalicylic  
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with CODEINE PHOSPHATE gr. ¼, No. 1 (N)

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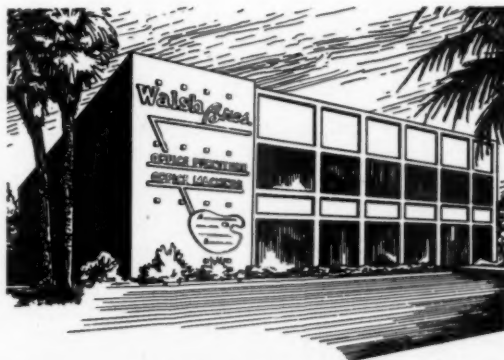
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with light sedation**

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*psychovisceral  
stabilizer*

ANTICHOLINERGIC • SEDATIVE

## In peptic ulcer management

- relieves pain promptly
- reduces tension safely
- tranquilizes without dulling
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- maintains anacidity for hours
- controls hyperactivity of upper gastro-intestinal tract

MONODRAL with MEBARAL—the “psychovisceral stabilizer”—provides for patients with ulcer and gastro-intestinal spasm an effective barrier against the impact of environmental stimuli . . . controls gastric hypersecretion and hypermotility for three and one half to five hours.\*

EACH TABLET CONTAINS:  
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MEBARAL . . . . . 32 mg.

DOSAGE: 1 or 2 tablets three or four times daily.  
Available on prescription only.  
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**C I B A**  
Summit, N. J.

*integrated relief . . .*  
mild sedation  
visceral spasmolysis  
mucosal analgesia

TABLETS (yellow, coated), each containing  
50 mg. Trasentine® hydrochloride (adiphenine  
hydrochloride CIBA) and 30 mg. phenobarbital.

3/10/56

# IX

nine candles on the cake — or whatever it is Blue Shield does to commemorate its birthday.

in so many words here's what those nine years of working together represent: approximately a membership of 138,000 Arizonans (quite an achievement in itself); cumulative payments of \$4,700,776 to doctors of medicine for care given Blue Shield members, with \$905,491.99 of this coming in 1955 alone; over 900 Arizona doctors of medicines as Participating Physicians in the nonprofit plan . . . to give you just an inkling . . .

plus all the skill and training that has done into the medical services rendered the people of this state.

we think that's really something to be humbly proud of . . . all of us.

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**A PLANNED INCOME PROTECTION  
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FOR ADDITIONAL INFORMATION AND OFFICIAL  
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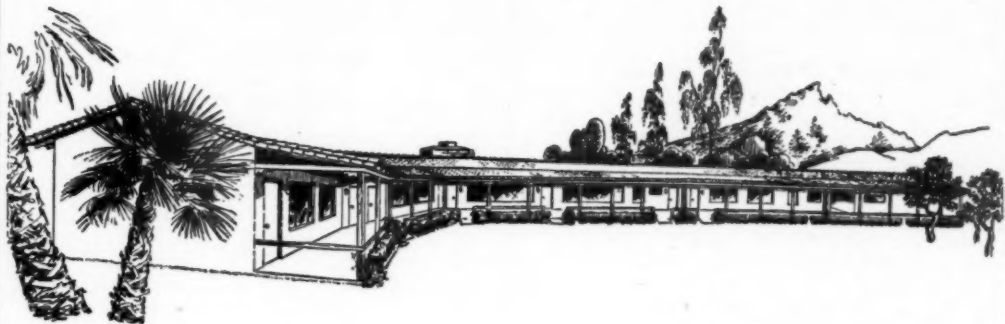
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550 W. Thomas Road — 101 Patio A  
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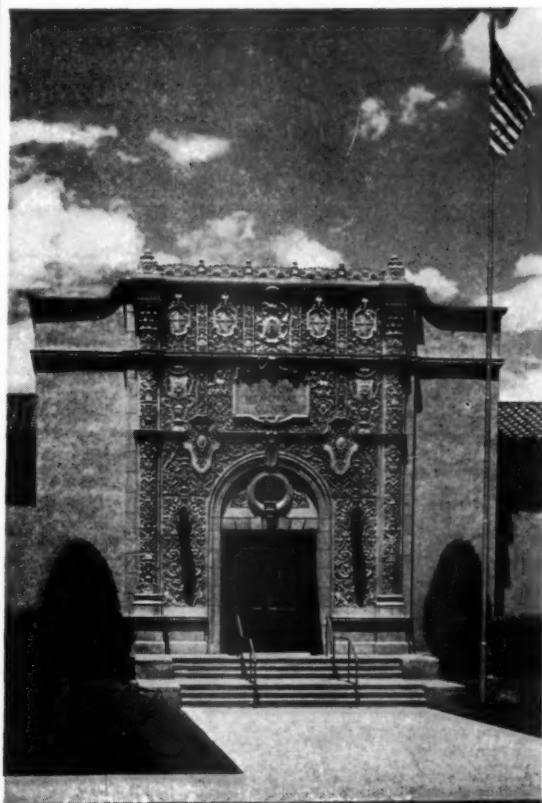
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